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AMERICAN Journal of Public Health AND THE NATION'S HEALTH

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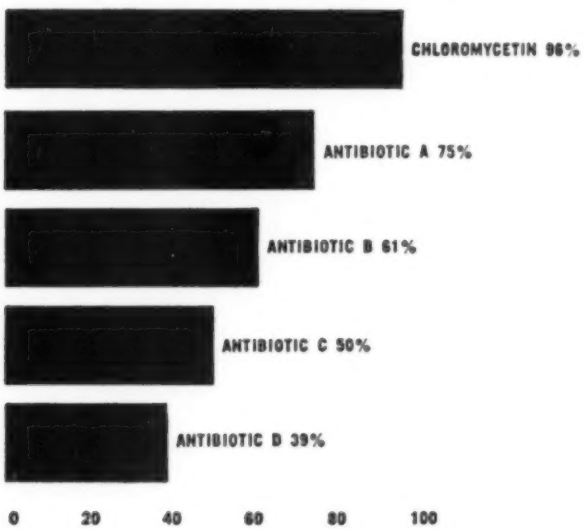

*Adapted from Godfrey, M. E., & Smith, I. M.: *J.A.M.A.* 166:1197, 1958. Staphylococci studied were strains isolated from infections of 28 general hospital patients.

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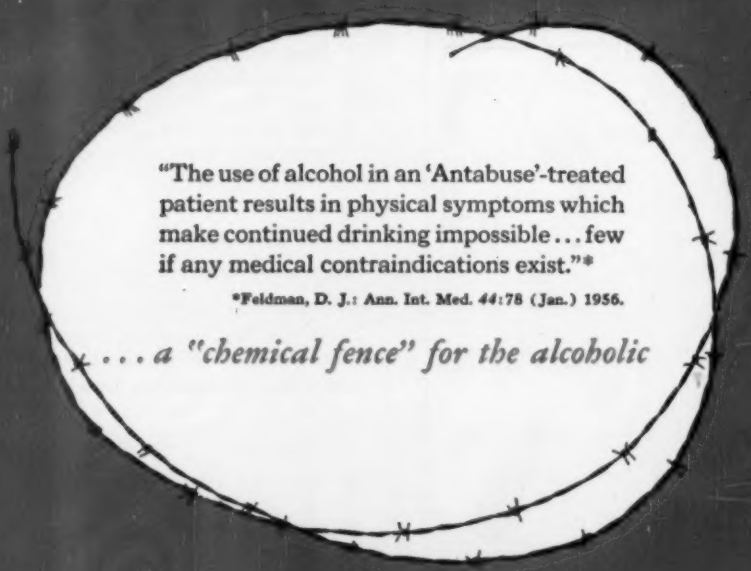
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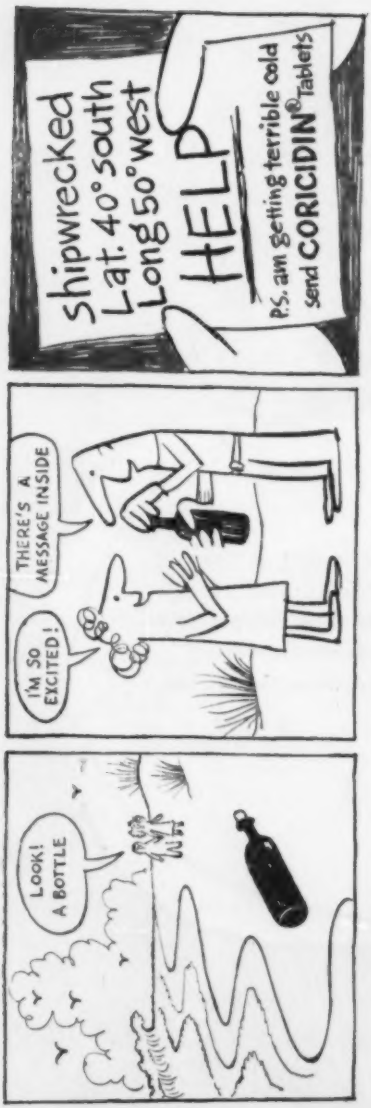

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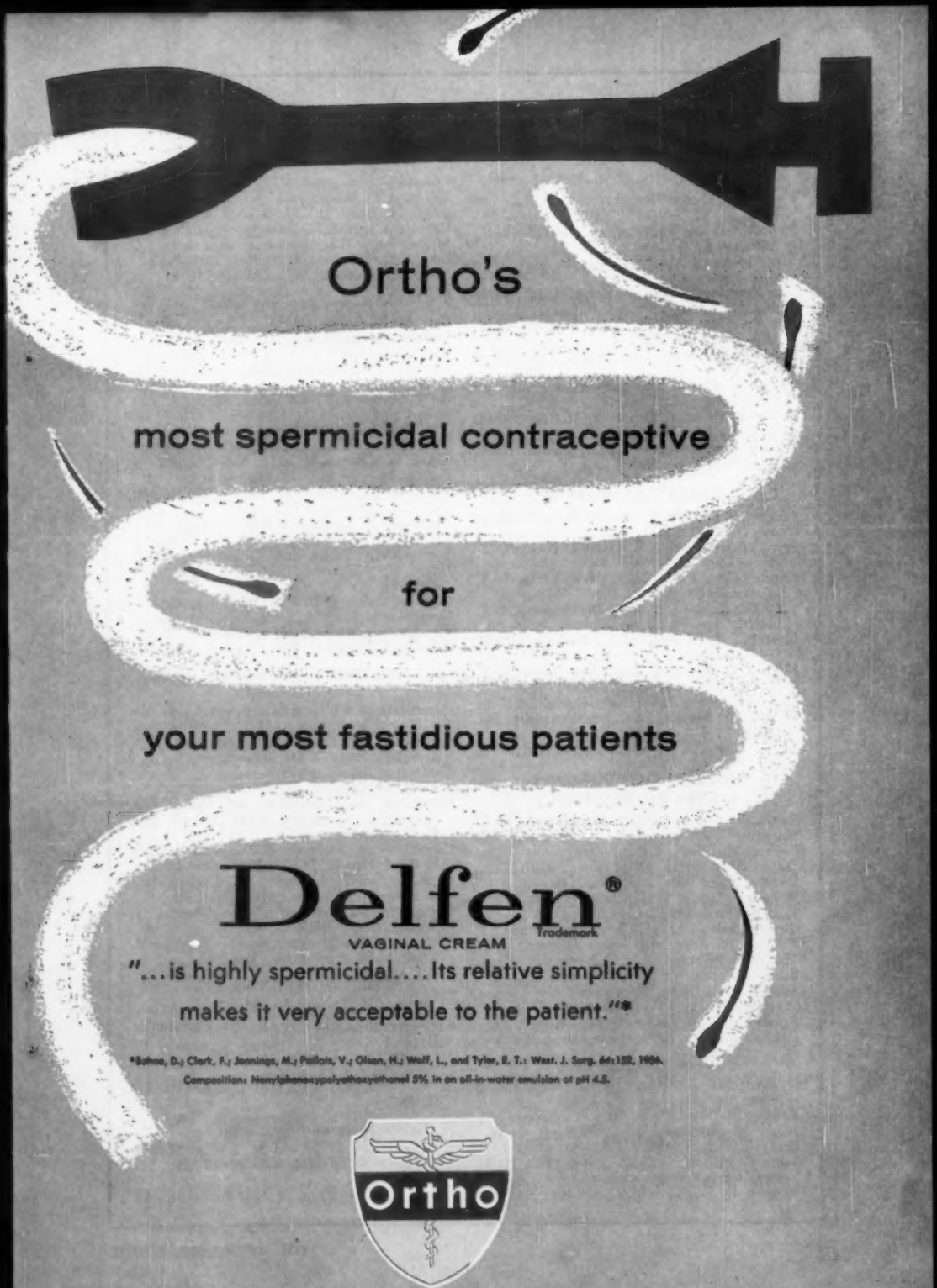
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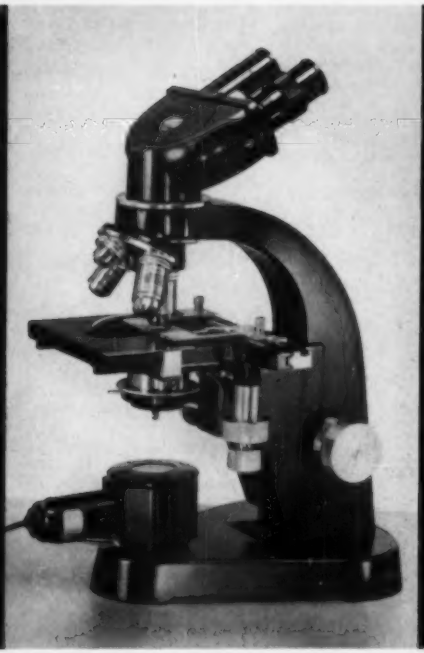

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1. Boland, E. W.: California Med. 88:417 (June) 1958. 2. Bunim, J. J., et al.: Arthr. & Rheum. 1:313 (Aug.) 1958 3. Boland, E. W., and Headley, N. E.: Paper read before the Am. Rheum. Assoc., June 21, 1958, San Francisco, Calif. 4. Bunim, J. J., et al.: Paper read before the Am. Rheum. Assoc., June 21, 1958, San Francisco, Calif.

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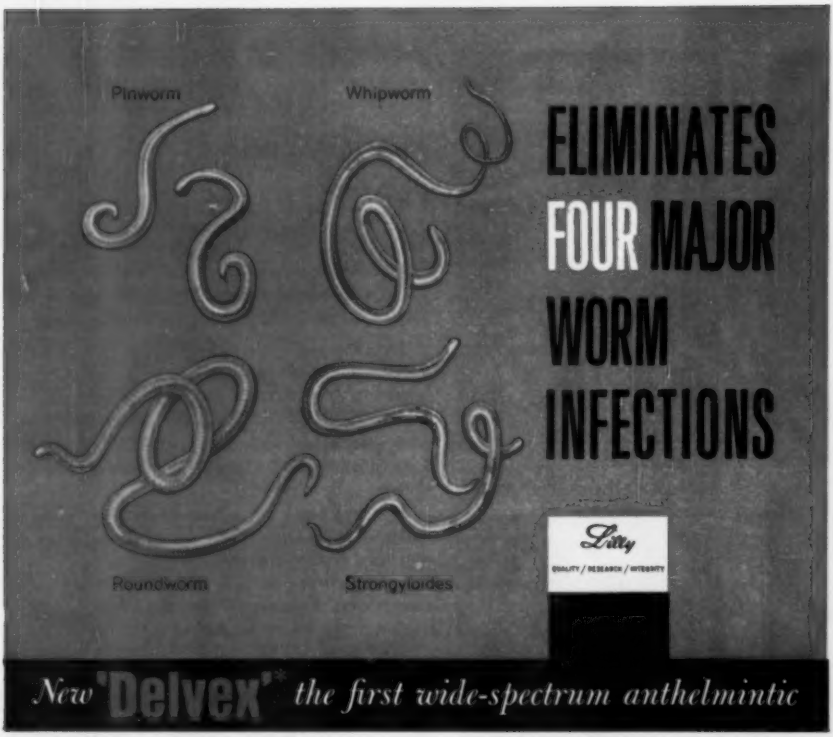

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*'Delvex' (Dithiazanine Iodide, Lilly)
1. Swartzwelder, J. C., et al.: J. A. M. A., 165:2063, 1957.

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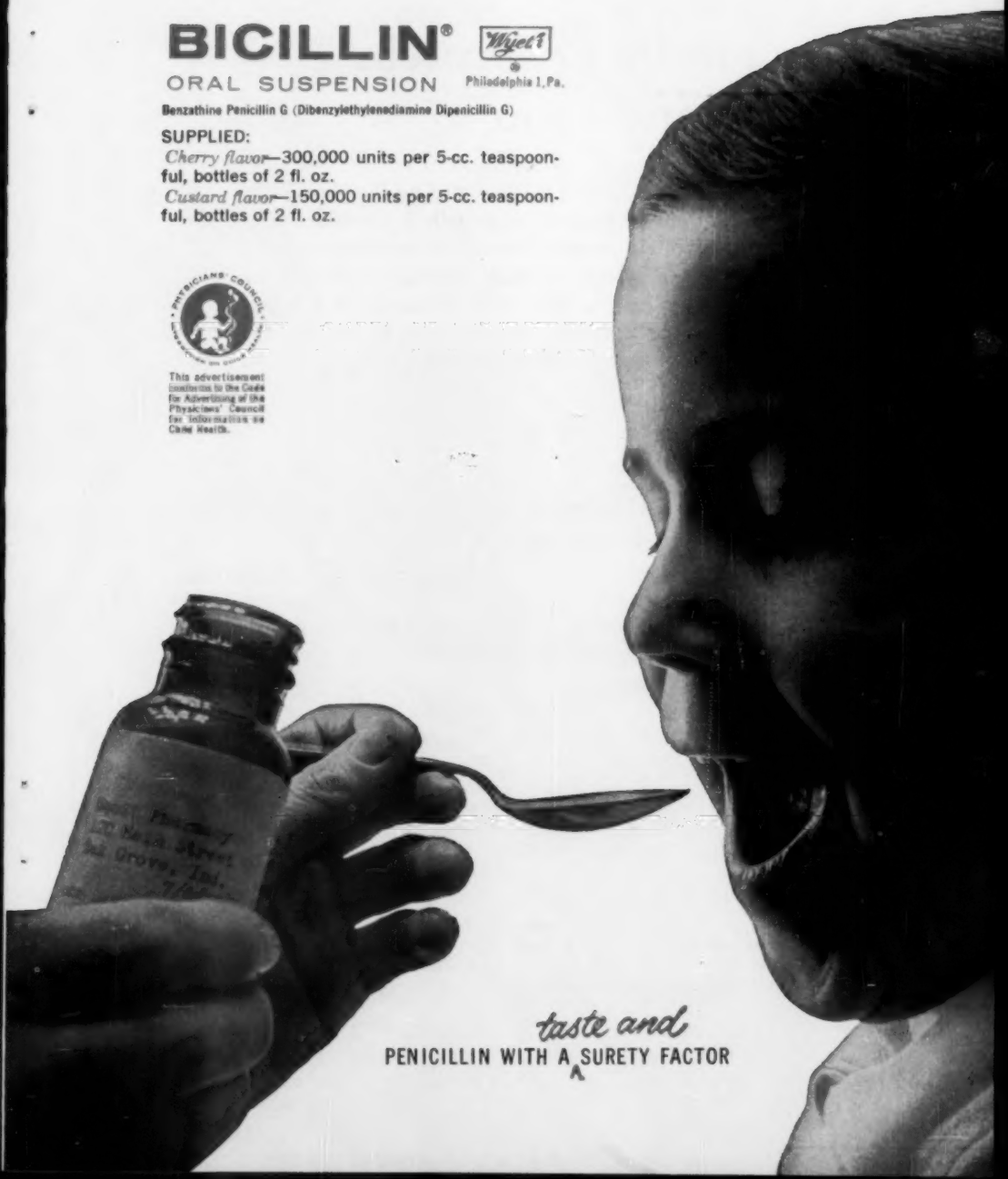

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	Calories from Fat	Calories from Protein
in the average American dietary	1	0.3
in beef rump roast	1	1.27
in beef flank steak	1	1.42
in lamb leg roast	1	1.55
in pork loin chop (lean portion only)	1	1.36
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*Leverton, R.: The Fat, Protein, and Calorie Value of Cooked Meats. Proc. 9th Research Conf. sponsored by the Council on Research of the American Meat Institute, University of Chicago, March 1957.

The nutritional statements made in this advertisement have been reviewed by the Council on Foods and Nutrition of the American Medical Association and found consistent with current authoritative medical opinion.

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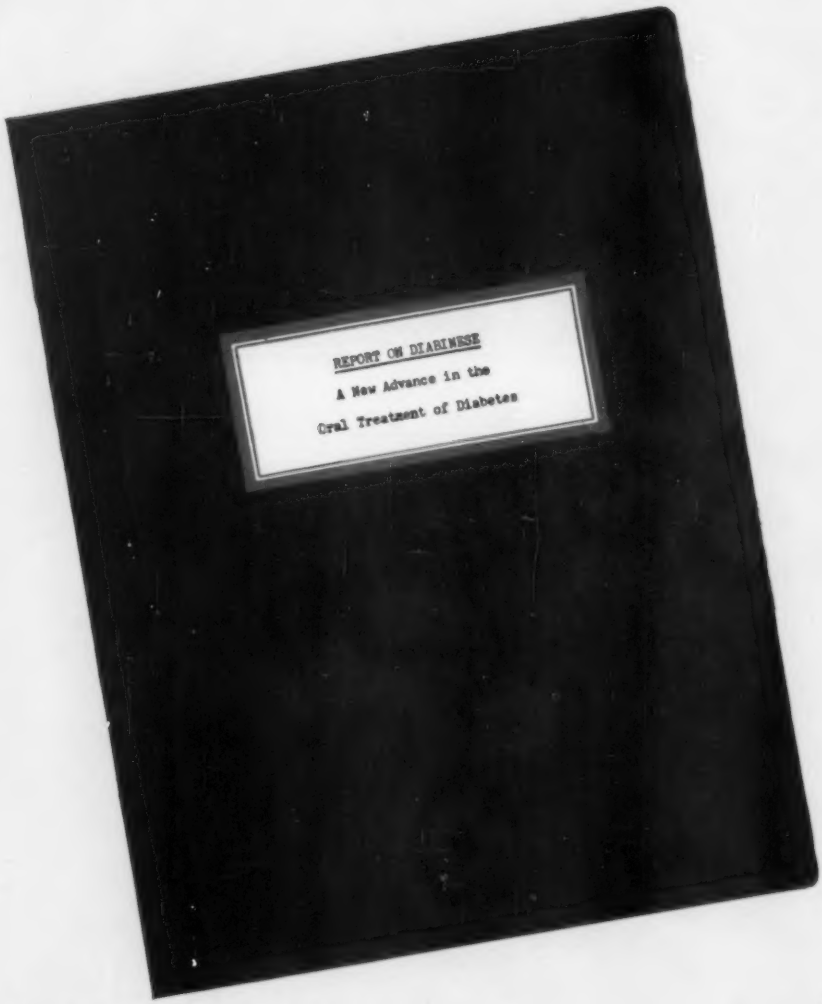
REPORT ON DIABINESE

A New Advance in the

Oral Treatment of Diabetes



The full Report on Diabinese appears in *The Journal of the American Medical Association* on pages 19 through 43 of the November 22 issue. Your personal bound copy is available from your Pfizer representative.

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An advance in potency

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Diabinese has a longer biologic half-life than tolbutamide. Excreted slowly, 80 to 90 per cent of one administration is eliminated in 96 hours. A single dose provides a therapeutic effect lasting 24 hours or longer. Since it remains in the blood as the active hypoglycemic material and is only gradually removed, Diabinese affords longer-lasting clinical benefit, with relatively constant blood levels, on *low, once-a-day dosage.*

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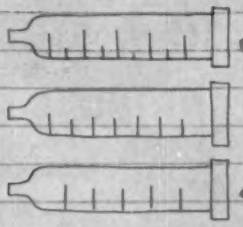

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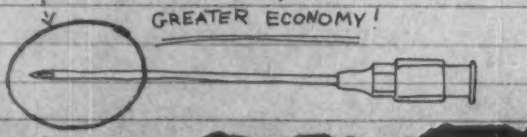

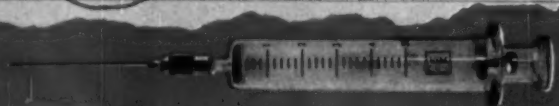

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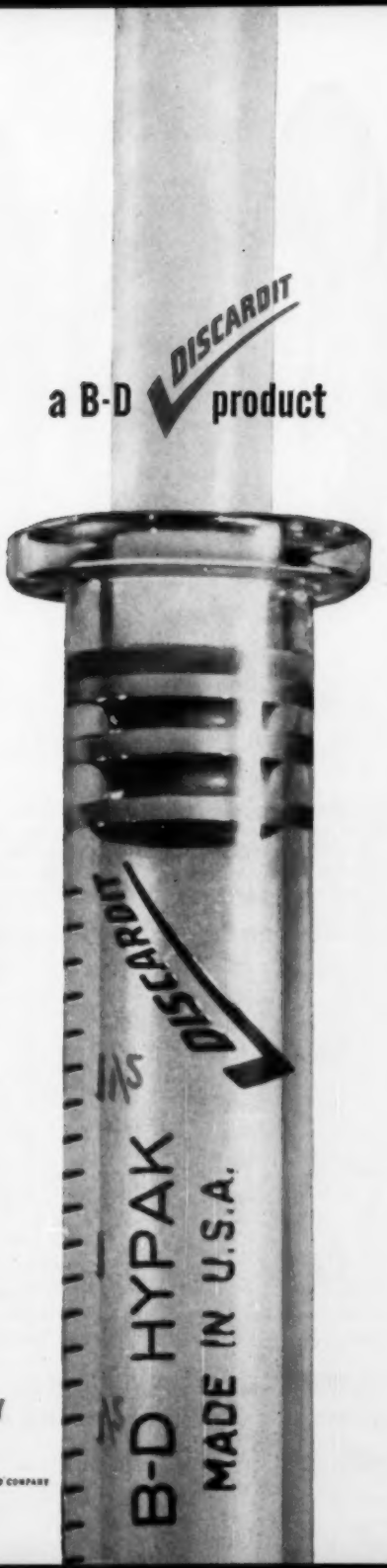

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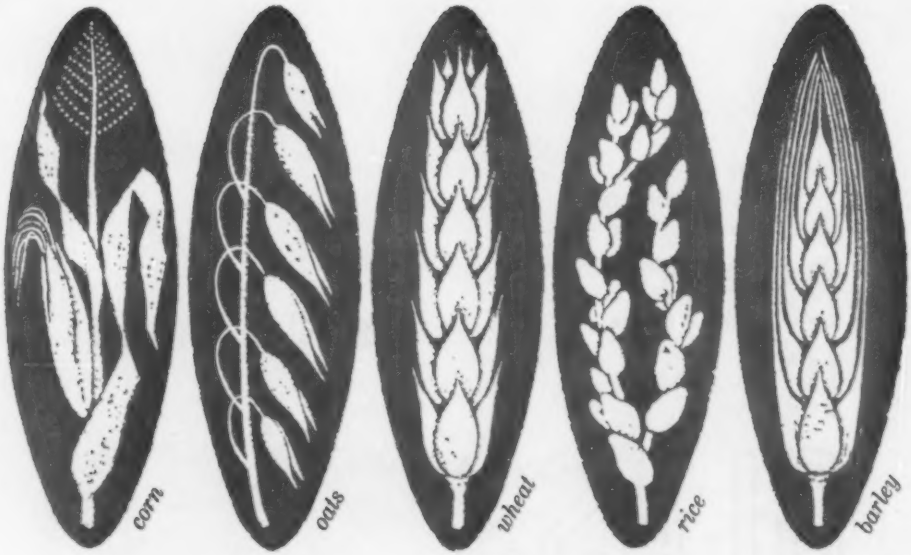

a moderate reduction in fat indicates cereal and milk serving

Medical and nutrition authorities recommend moderation and reasonableness in food choice as a best guide to good health. When a moderate reduction of dietary fat is indicated, a good choice is the cereal and milk serving for breakfast and the late evening snack.

Both the breakfast cereal and the milk contribute well-balanced nourishment and provide quick and lasting energy. This serving, as shown below, is a good source of many nutrients and provides about 10 per cent of the daily recommendations of high quality protein, important B vitamins, and essential minerals. Served with nonfat milk, the fat content is very low.*

nutritive composition of average cereal serving

	Cereal, 1 oz. Whole Milk, 4 oz. Sugar, 1 teaspoon	Cereal** 1 oz.	Whole Milk 4 oz.	Sugar 1 teaspoon
CALORIES	203	104	83	16
PROTEIN	7.3 gm.	3.1 gm.	4.2 gm.	
FAT	5.3 gm.	0.6 gm.	4.7 gm.*	
CARBOHYDRATE	32.2 gm.	22 gm.	6.0 gm.	4.2 gm.
CALCIUM	0.169 gm.	0.025 gm.	0.144 gm.	
IRON	1.5 mg.	1.4 mg.	0.1 mg.	
VITAMIN A	195 I. U.	—	195 I. U.	
THIAMINE	0.16 mg.	0.12 mg.	0.04 mg.	
RIBOFLAVIN	0.25 mg.	0.04 mg.	0.21 mg.	
NIACIN	1.4 mg.	1.3 mg.	0.1 mg.	
ASCORBIC ACID	1.5 mg.	—	1.5 mg.	
CHOLESTEROL	16.4 mg.	0	16.4 mg.*	

*Nonfat (skim) milk, 4 oz., reduces the Fat value to 0.1 gm. and the Cholesterol value to 0.35 mg.
**Based on composite average of breakfast cereals on dry weight basis.

Bowes, A. deP., and Church, C.F.: Food Values of Portions Commonly Used. 8th ed. Philadelphia: A. deP. Bowes, 1956.
Cereal Institute, Inc.: The Nutritional Contribution of Breakfast Cereals. Chicago: Cereal Institute, Inc., 1956.
Hayes, O. B., and Rose, G. K.: Supplementary Food Composition Table. J. Am. Dietet. A. 33:26, 1957.

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The pioneering work Diversey has done in these fields is almost legendary. In the dairy farm field, Diversey worked with the public health authority of a large dairy state to develop the first accepted techniques and products for pipeline cleaning in place. They were the first to develop a complete bottlewashing compound that also controls scale. First again with color-coding of compounds to prevent mix-ups.

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Journal of Public Health

The presidential address this year gives a well balanced review of where we are and where we are going in public health.

CONSOLIDATION FOR STRENGTH

Roy J. Morton, C.E., F.A.P.H.A.

THE PUBLIC HEALTH profession is increasingly concerned with the perplexing problems and the inadequacies of present-day programs. Again and again in our planning we ponder the increasing scope of public health demands, the rapidity of change, the mounting pressures of new and growing health problems, the shortages of qualified personnel, the need to obtain more knowledge through research, and above all the increasing difficulty of coordination in the planning and execution of activities. In moments of pessimism we may wonder whether the profession can mobilize its abilities and increase its strength sufficiently and rapidly enough for success in meeting these challenges.

For this important occasion I have chosen to address my remarks to several aspects of consolidation as an aid in achieving greater strength and effectiveness. Although I cannot explore this subject fully, I will make some suggestions about the necessity to consolidate: (1) the forces for health, (2) the past gains in public health, and (3) the elements of support for public health services. Finally, I should like to comment on the role of the American Public Health Association in efforts to unify and strengthen public health programs throughout the United States.

Unity and Strength

No one disagrees with the axiom that in unity there is strength. Through teamwork properly applied, health agencies can achieve more beneficial results and build up more effective participation and support. But in a complex undertaking, such as public health, there is a vast area of definition, decision, action, and sometimes conflict, between acceptance of the concept of unity and its practical realization. Each of you may recall from your own experience examples of cooperative projects which, though unopposed in principle, were hampered in execution by unexpected disagreements regarding details. A potential weakness in any joint enterprise is the possibility that some of the partners, while wanting the advantages of cooperation, will want to cooperate in their own way.

It may be helpful at the outset to examine the meaning of the terms "consolidation" and "strength" as used here in relation to public health. The word "consolidate" may have many meanings, depending upon the subject being dis-

cussed. Several are appropriate in speaking of public health situations. Most commonly, to consolidate means to make firm by bringing together in close union to form a compact body or mass. In this sense the purpose of consolidation may be broad and general, or it may be limited to a particular objective. In a consolidated program the participating groups can maintain their identity, but they must obligate themselves to direct certain of their functions toward the specified objectives of the joint effort. This familiar approach is exemplified in various groups, such as community health councils, joint committees, interagency boards, interdepartmental commissions.

In a more rigid sense consolidation may mean an actual merging into a single unit, as when several small health agencies are combined under one administrative head.

We should consider the meaning of "strength" in terms of the ability of the public health system to meet present and future problems. These considerations are subtle and complex. The reservoir of potential strength for public health accomplishment is in the professional training, abilities, and attitudes of workers in the various fields that can contribute toward the aims of public health. To be effective, this potential strength, once developed, must be brought to bear specifically upon public health needs in a way that affords the best opportunity for success.

This concept of strength in a public health program does not suggest a highly centralized organization of dominant power, but rather a well managed movement of flexible composition and structure. It is obviously necessary in such a movement that the basic aims and guiding principles should be understood, agreed upon, and widely known in advance as a basis for a truly united effort. In order to be strong a program must have first of all unity of direction. To operate successfully it must have the prestige, momentum, variety of resources, and flexibility of function necessary: (1) to fulfill any important public health requirement, and (2) to resist successfully any opposition based upon unsound premises.

Dilemma of Public Health Strategy

I realize that these definitions may seem somewhat abstract. However, we must understand the implications of consolidation and of strength in order to appreciate the dilemma of public health strategy which health authorities now face and to consider the means by which it may be resolved. On the one hand, it is not feasible to provide in the official health programs the variety of personnel and facilities necessary to meet all of the diverse and rapidly growing demands for public health guidance and service. On the other hand, it is difficult to maintain high standards of professional public health practice, since many of our health services must rely upon the resources and programs of other agencies not motivated primarily by public health considerations.

The need for readjustment in public health programs has been recognized and in recent years has been the subject of extensive studies by governmental agencies and private groups. Of outstanding significance has been the series of discussions on "Where are we going in public health?", spearheaded by the American Public Health Association and culminating in the Task Force Study and Report in 1956. This Association comprises the entire spectrum of public health leadership. Hence, its study of these basic questions represents not only the interests of the APHA but also of the whole public health profession. It is generally agreed that for optimum development of our potentials for good health there are two critical requirements: (1) more adequate funds and

trained personnel, and (2) competent public health leadership in implementing an all-inclusive program.

In an address 20 years ago this week Abel Wolman, the then incoming president of the Association, commented on the political implications of accepting health services as an obligation of government. In England, where the economic advantages of preventive health services were officially recognized a hundred years earlier, Sir John Simon was quoted as saying, "Health necessarily began to take rank as an object of practical politics." Wolman referred to the findings of the Interdepartmental Committee of the United States government in 1938 and the recommended expansion of official public health programs. He said, "Public health now enters seriously for the first time the field of competition with other governmental activities. . . . If it succeeds it becomes at once a competitor of the ancient and powerful consumers of public and private funds—armaments, highways, flood control, navigation, general education, etc."

Since the passage of the Federal Social Security Act in 1935 much progress has been made in securing public funds from federal, state, and local appropriations, and in using them for research, training of personnel, and expansion of official public health programs. Also, the interest and support of a multitude of related agencies, both public and private, have been enlisted in the cause of public health. We should recognize, furthermore, that in many areas well rounded health programs have reached a high level of effectiveness in the 20 years. We cannot escape the fact, however, that favorable situations of this kind in states and local communities are far from universal. In spite of continued efforts by many people on many fronts, public health as a whole is not yet doing very well in its competition for funds and personnel.

A summary of the present status of community health services in the nation, presented last March by Dr. Jack C. Haldeman,* showed that during the past five years there has been little change in the extent of organized local health services—about 2,200 counties have such services, 1,400 of them full time. Altogether, they serve about 90 per cent of the population, but "many areas with official health agencies of some kind enjoy the thinnest coverage." In fact, the ratio of health department personnel to population was less favorable in 1957 than in 1951.

On the financial side, increases in local health expenditures have barely kept pace with the increased costs of health department operation; and the increases are distributed very unevenly. Two states accounted for one-half of the total rise in state expenditures for local health services between 1950 and 1957; five states accounted for nearly two-thirds of the increase in local expenditures.

In "Public Health Reports" last August Dr. Otis L. Anderson discussed training opportunities for public health personnel. Several of his statements are directly pertinent to our present subject. Some 17,000 professional positions in state and local health departments throughout the country call for graduate or specialized public health preparation, but almost 9,000 persons in these positions are without such training. Thus, "more than half of our nation's public health workers have not had the training that provides a sound and balanced knowledge of the multidisciplinary technical aspects of health problems, and of the relationship of health problems to the social and economic fabric of the community. . . . Since 1951 there has been a 10 per cent increase in our national population; the number

* This paper, Development of Community Health Services, will appear in the January, 1959, issue of the A.J.P.H.A.

of full-time personnel in state and local health departments has increased only 6 per cent. Indeed, we actually have fewer physicians and engineers in public health today than we had in 1951, with 15 million more persons to be served. . . . Obviously under these conditions our public health services cannot keep pace. . . . In point of view, public health has advanced with the times, but its supply of trained workers has not."

The experience of the past has been that when difficult new problems arise they are met with increased effort and with testing new approaches until reasonably satisfactory solutions are found. Today there is evidence that we are making good progress toward well defined objectives—improved armamentaria used with increasing effectiveness and in attacks on specific problems. With the results of expanded research becoming available, the guidance from epidemiological analyses of cause and effect, and the increased interest and participation of specialists in related fields, we have every reason for optimism to believe that the perplexing new problems can be brought under control.

From the viewpoint of long-range strategy, however, there are in evidence two disturbing trends that cause concern—the horns of the dilemma mentioned earlier. The first is that the over-all health needs, which the official public health agencies should provide for, are increasing more rapidly than available facilities. Meanwhile, the health worker spreads his efforts thinner, the pressure of routine demands and new professional obligations build up, and frustrations are inevitable.

A second and more disturbing portent for the future is evidence that the weight of public health agencies in defining public health criteria and procedures is not keeping pace with the new developments. Thus, there is an increasing tendency toward splintering public health responsibility and authority and the dispersion of essential services to various existing or newly created agencies. If this trend continues it will undermine the influence of professional public health leaders and destroy the unity of health programs necessary to effectiveness.

In order to meet these two basic challenges, the public health profession needs to augment its strength as a whole with emphasis on particular areas of activity. In my judgment it is essential that we restudy the strategic position of public health and shape our programs to increase their influence on public policy and counteract the trend toward scattering responsibility.

Elements of Strength and Their Mobilization

It may be well at this point to ask more specifically: What are the basic elements of strength in public health? What are the most important things to be done that will enhance the ability of workers at each level of organization to meet the demands of present and future problems?

As defined earlier, strength in public health signifies the concurrent existence of at least three essential conditions:

1. A reservoir of available resources upon which the public health administrator can depend for the scientific knowledge, professionally competent workers, physical facilities, and authority for planning and direction of the broad and flexible health programs that are increasingly necessary.

2. Service programs through which the special knowledge and abilities of many people in public health and related fields can be brought to bear effectively upon various problems.

3. A broad and sturdy framework of understanding of basic principles, agreement on objectives, and enthusiasm for action on the part of public health and health-related agencies, professional

groups, and the general public. With the support provided by such a structure, both broad public health programs and highly specialized projects can be assured of the opportunity for enduring accomplishment with a minimum of hindrance and uncertainty.

Mobilization of the Forces for Health

The most promising method by which we can greatly increase the resources of organized public health is to integrate into the public health system the various other public and private forces that are oriented or that can be oriented in the direction of public health objectives. For example, official agencies other than health departments have interests and working programs in various aspects of health; industry and labor are increasingly inclined to use their own resources to meet their own health needs. In many places the programs of voluntary health groups, civic organizations, private research agencies, and various others could be tied in more closely to public health programs. Health leaders must take the initiative in order to gain maximum aid from other programs having a health component.

The obvious advantages we seek to gain by joining forces with others are a greater variety of essential knowledge and skills, more available manpower, and increased volume of health services. We should also give more thought to consolidation for its own sake as an element of strength. It is important to remember that individual effort is significant only in its relation to group effort. Likewise, the success of an individual cooperative project, however important, is of greatest significance only if it eases the way for similar projects in the future and adds to the momentum of the movement as a whole.

If time permitted, any number of complex public health problems might be discussed to illustrate the necessity for consolidation. We could describe, for example, the various specialized services required in programs of radiological health, air pollution control, stream sanitation, medical care for the indigent, vocational rehabilitation, accident prevention, industrial hygiene, or mental health. In each of these fields there are, in addition to public health departments, a number of other public and private agencies with professional or legal responsibilities, or both, and in many cases organizations already at work. It is apparent, however, that these problems cannot be solved by any one of these agencies working alone nor by all of them together unless an efficient working relationship can be established.

In undertaking this difficult task it is essential to keep in mind the axiom that government by laws is more equitable and enduring than government by men. In the same way the mutual benefits and the stability of cooperative endeavors will depend upon our collective abilities to follow established principles rather than expediency in their planning and operation.

The sheer problem of integration of the functions and responsibilities of the various agencies concerned with health is one to give us pause. I have no ready answers as to how this problem can best be approached. Teamwork is never easy. To realign and consolidate effectively the numerous diverse governmental health activities and the public and private health-related programs involves fundamental questions of public health practice, governmental policy, and human relations.

One favorable aspect, summarized nicely by Wolman, is that "Many of these problems assume immeasurable difficulties on paper while their administration in fact goes on around us." We do not have to wait for the adoption in toto of an all-inclusive plan for interagency cooperation. For example, you may be baffled and discouraged by the

complexity of the legal and administrative systems of federal, state, and local government and the interplay of public and private forces in matters pertaining to health services. Yet, I feel sure that most of you have worked with one or more successful cooperative health projects, planned and executed primarily at the working level. Each successful joint effort will add its increment to the strength and stability of public health as a whole, so long as it represents acceptably the principles of public health practice and satisfies the primary interests of the other participants.

Consolidation of Services and Support

I have spoken at some length about the necessity to increase the resources available for health services, both by expansion of the pulbic health organization and by cooperative arrangements with others. Paralleling the need for greater resources as a prerequisite for strength is the necessity for effective and flexible work programs. It is important that we move as rapidly as possible to consolidate past gains and readjust service programs according to current demands and conditions. The purpose is to make the best use of the facilities we have, realize the maximum of benefits from previous work, improve public relations, and develop stronger support for our program as a whole.

We should continue to make and improve program evaluation studies. But the greatest rewards in the near future are promised by concentrated efforts to extend the coverage and increase the effectiveness of service programs. Some examples of common weaknesses in various services are: their effectiveness has not been adequately evaluated; there is insufficient coverage to secure their full benefits; there are unreconciled differences of professional opinion; the existence and importance of programs have not been understood by the public and often not by related professional groups; there is lack of popular appreciation of the value of services as compared to their costs; there is lack of agreement among responsible agencies as to purposes and functions; and there is the well known lag in bringing new information into practical application.

I realize that there is strong competition for the time and effort of public health practitioners. Pressures of the newer program demands make it difficult to expand and develop to the peak of their effectiveness existing essential services. Again there are no ready answers. But ways and means must be found by which the important established services can be continued and evaluated, and the results reported. Each good program, if widely recognized, is an asset in public relations and increases its strength by the very impetus of its success. A good program is the best argument for obtaining funds to develop comparable new programs and for putting them under the direction of the health department.

The third essential condition for strength mentioned earlier is a broad and sturdy framework of support and protection. This must depend upon understanding of principles, agreement on objectives, and enthusiasm for action on the part of various groups and the general public. Each is closely related to the work program—the sine qua non of public health salesmanship.

In many cases in the past support and protection for health programs have been obtained largely by personal and emotional appeals. For example, the people have faith in the health officer as an individual and move to his aid when he needs the pressure of public opinion. Such emotional appeals are uncertain of results and likely to be transitory in their effect. We must develop on a sound scientific basis continuing programs of public relations and health education that will be effective in advancing health services on their own merits.

The Role of the American Public Health Association

Ten years of intensive self-appraisal in the American Public Health Association were brought to a climax in 1956 in the Arden House Conference and the Task Force Report. This was followed by a year of planning and reorganization of Association structure and functions as recommended by the Task Force.

The year 1958 has been devoted to consolidation of the resources and programs of the APHA itself. The purpose is to prepare the Association for a larger role in strengthening the whole public health movement. This has been a year of action during which encouraging progress has been made in carrying out most of the Arden House recommendations. The details of this progress, including additions to the professional staff, decentralization of certain services through regional offices, and the important programs of newly organized committees will be found in the report of the chairman of the Executive Board and the several committee reports that will constitute the record of this Annual Meeting.

The APHA is in an uniquely favorable position to mobilize public health leadership and to contribute to the solution of problems concerned with strategy and tactics. It is the only independent national agency dedicated to the over-all objectives on a professional level. Also, it is the outstanding agency in this country in a position to serve as a spokesman on issues of basic public health policy.

The APHA does not itself operate community service programs. However, it is not apart from the complex of official and unofficial health agencies that render the services to the public. APHA members are the workers in all kinds of health agencies. Their interests in the APHA and in the practice of public health are identical. Within the structure of the Association, leaders in the field can and do exert their influence apart from the prejudices and restraints of their official positions. Here they can contribute objectively to professional group opinions, decisions, and actions.

Because of its diverse and distinguished membership and the collective influence of its 13,000 individual members and nearly 50 affiliated local societies, the APHA is in a strategic position to follow local and national developments affecting public health, take a strong stand on important issues, and wield a decisive influence in solving vital public health questions.

It is an obligation of the APHA to provide leadership, stimulation, guidance, and consultation, especially in the field of public health administration and in the areas of expanding public health needs.

The problems we face in efforts to increase further the adequacy and stability of public health services deserve the ablest leadership available.

A keystone of the public health profession's basic policy should be more diligent and aggressive efforts to safeguard its fundmental functions and to find the means to discharge more fully its obligations of service for the welfare of all the people.

I earnestly hope that through the leadership of the APHA and other dedicated groups the forces of health may be joined, and that while we are winning our battles on small fronts, we will at the same time buttress the broad front of public health as a whole.

Mr. Morton is associate leader, Waste Disposal Research and Engineering Section, Oak Ridge National Laboratory, Oak Ridge, Tenn.

Presidential address to the American Public Health Association at the first General Session of the Eighty-Sixth Annual Meeting in St. Louis, Mo., October 28, 1958.

The death of Andrija Štampar has removed from the international health scene one of its commanding figures. Dr. Hyde pays affectionate tribute to a man who believed and acted on his belief that all human beings have a right to health and well-being.

A TRIBUTE TO ANDRIJA ŠTAMPAR, M.D., 1888–1958

Henry van Zile Hyde, M.D., F.A.P.H.A.

IT WAS THE spring of 1946, the third day of the session of the Technical Preparatory Committee of the World Health Organization at the Palais d'Orsay Hotel in Paris. Down the long corridors stomped a broad-shouldered storm cloud with a rounded head. As he approached us, standing outside the door of the gilded room serving as the secretariat office, he broke into a staccato outburst of expressive English, unembroidered by articles and connectives. His wrath was justified. It had taken him seven days to traverse the distance from Zagreb to Paris, with interminable interruptions in unexpected and inconvenient places for inspection of his documentation. It was postwar Europe.

Thus, some of us met Andrija Štampar, a man whose name we had known and whose force we had already felt, the man known to many in a seriocomic vein as the "Bear of the Balkans." It was to be our privilege to know him and work with him for the next 12 years. His death is a personal loss and a loss to public health, for he was indeed one of the great men of our profession.

Andrija Štampar—as he unfolded his tale bit by bit over the years—was the son of an itinerant pedagogue in Croatia, itinerant not because he loved to wander but because of his liberalism. Soon, in any village, he would test the mettle of the conservatives with his views on life and society, and would in due course be asked to leave forthwith. Packing wife and worldly goods into a donkey cart with children trailing along, he would move to another village where his expanding reputation had not yet penetrated. In due course, the story repeated itself. I learned this from Andrija Štampar, one of the boys who trudged behind—only to march forward in later life proclaiming on a world stage the liberalism learned in such a hard school.

In the course of this tenuous existence, one dear lady recognized the potentialities latent in her son's playmate and took Andrija under her wing. In due course she made it possible for him to go to Vienna for an education. He told me once of this trek. His mother provided him with a ham to sustain him on his long walk north. On arrival in Vienna, the young, lone wanderer found a boarding house and moved in. Very shortly a crisis developed. He had finished his ham bone and disposed of

it in that new wonder—new to him, that is—the inside flush toilet. He said, and doubtless quite rightly, that the result was catastrophic for the plumbing and led to altercations with his new-found hosts. Thus began the education of a great sanitarian.

On his return to Yugoslavia, he rejoined his family, now in better circumstances. His education had been intensive and he was an intense man. And he was profoundly shy. When his sister had friends visiting her, he would repair to his room and lose himself in his books. On one occasion his sister created a crisis by inviting a friend to spend the week end with her. Before dinner she went to her brother's room and told him that he must make an appearance and must also join in the family activities throughout the week end. There was no escape for Andrija. So, having combed his hair well and dressed appropriately for the ordeal, he went to the living room, stood in the door, and surveyed the group. His eyes lit upon his sister's friend across the room; he stood transfixed, and then pointing at her blurted out, "I'm going to marry you." During the succeeding months he trudged over the fields in the moonlight to sit enraptured outside her house, eventually gathering sufficient courage to call upon her. In due course, yes, he married her. The clarity of vision, the decisiveness, and indeed the shyness persisted through the years as hallmarks of his character and personality.

This doctor of medicine became progressively a doctor of public health, but never lost touch with the science of medicine. When his country, Yugoslavia, was created at Versailles, he became its first director of health. Perhaps it would be more accurate to say that in this new country, new and amorphous, he gave leadership to the development of what became its public health service. It was characterized by quality, breadth of coverage, and the spirit of service. It reflected the intensity and the quality of the man himself and soon became a model health service on which the eyes of the world were focused through the League of Nations, which he was called to serve for six years from 1931 to 1937. Later his influence spread through his activity as a teacher, as visiting professor of public health at the University of California, and as professor and later rector of the University of Zagreb.

Then came the collapse and destruction of World War II. He was captured when the Germans moved into Zagreb. Again he had a story to tell. He was at first imprisoned in his home town. His first wife had died some years before and he had married a lovely, gracious physician who had been a member of his public health staff. He liked to tell, jokingly, that he had married her because she brought so many problems to him that he decided the best solution was to take her out of public health. This was his shy way of covering up with a jest one of the tenderest and most delightful marriages it has ever been my joy to witness. But to get back to the prison story, Mrs. Štampar nightly made rounds of the prison walls hoping to catch a glimpse of her husband at one of the windows. Night after night she did this with no luck. One night she noted a cluster of women standing in front of the great main gate. It appeared that they were to be admitted into the prison for some reason that was not apparent. She took a chance and joined the group. In due course, the German prison guard threw wide the huge iron gates and waved the group of women in. They were then conducted in a direction which Mrs. Štampar, as a physician who had attended patients in the prison on occasion, recognized as the route to the clinic. Then it suddenly struck her that she was in the midst of a group of prostitutes headed for inspection. On arrival at the clinic, she

was recognized by the physician in charge, a Zagreb colleague. He beckoned her aside and ushered her into a side room without comment. He then summoned Dr. Štampar to report to the clinic and ushered him into the same room. Every night thereafter Mrs. Štampar visited her husband until he was whisked away into a prison in Austria. When she next saw him, she did not recognize him. An emaciated shadow of himself, he walked unheralded and unrecognized up the sidewalk to the porch of his home, where the family was sitting.

Andrija Štampar recuperated quickly from his grim years in prison, and emerged rapidly into world leadership. When he appeared in Paris on that day in 1946, he was not just the competent health expert of Yugoslavia, he was also vice president of the Economic and Social Council of the newly formed United Nations. It was under his acting chairmanship of that council, in fact, that the Technical Preparatory Committee for the World Health Organization had been organized and convened. He was again a world leader. During the weeks in Paris, those of us who worked with him soon overcame our trepidation and found that the "bear of the Balkans" was a very friendly bruin indeed—a friend of all mankind.

The next time that many of us saw Dr. Štampar was at the International Health Conference in New York a few months later when the constitution of the World Health Organization was drawn up and adopted. He called that unique conference of nations to order, turning the gavel over to Dr. Thomas Parran when the latter was elected its president. Štampar continued to take a leading role in the conference as chairman of the Yugoslav delegation and a member of the steering committee. His prestige, the force of his personality, and the general aura of wisdom that surrounded him made him one of its most effective participants. Probably his major contribution to the constitution of the World Health Organization, as one looks back on the Paris and New York meetings that developed it, was the broad vision incorporated in its oft-quoted preamble.

At New York an Interim Commission of 18 nations was established and Štampar was elected its chairman, presiding over the commission at its meetings, which took place quarterly during the succeeding two years. This was not an easy task. There were knotty, emotionally charged problems to be decided that would shape the long future of the World Health Organization. Divisive forces were at work. Cultural backgrounds varied widely. Experience in international cooperation was limited, but faith and hope were high. Disparate basic objectives split East and West. There was great imbalance in national strength, both technical and financial. Different interpretations, even of the workings of the democratic process, intruded themselves. The validity of the vote, which we accept so instinctively as a useful and welcome device to settle controversial points, was even open to question.

Over this complex situation Štampar presided with skill, charm, and effectiveness, becoming, as "Time" magazine once pointed out, a crusader for unanimity. The decisions taken during the two years of the life of the Interim Commission brought organization into the disordered international health scene, fused existing agencies into the new structure, launched new programs, and set the pattern for even bigger things in the WHO itself.

Then in 1948 came at last the First World Health Assembly—commemorated this year on its tenth anniversary—at which the road had to be laid out for the long future of the WHO. Basic decisions on organizational structure, administration, budget, program had to be

made. There was a tussle over the question whether the organization should be a technical one providing technical services, or a supply organization on the pattern of UNRRA. There were other questions that would determine the very nature of this new world enterprise. Over all this Andrija Štampar presided.

Štampar sat high on the podium of the great Assembly Hall of the Palais des Nations, known to diplomats and sight-seers the world over, at the moment of greatest crisis in the affairs of WHO. In accepting the WHO constitution, the United States had reserved the right to withdraw. In the nature of things diplomatic, it is necessary that all parties to an international agreement accept any reservation made by a ratifying nation. Normally, this is done through the long, slow, and cumbersome methods of age-old diplomacy. In this case, however, the secretary-general of the United Nations, with whom the treaty had been deposited, ruled that he would accept the United States ratification as valid if the Assembly, representative of the full membership of WHO, made a unanimous request that he do so. Here was a great moment in the life of WHO. Would any single nation oppose United States membership? The members of the Soviet bloc, no longer allies of the West, were in the Assembly Hall, duly accredited. A Yugoslav was in the chair. It was June, 1948, and within days Yugoslavia was to be unceremoniously booted out of the Cominform. Things were tense among nations. Friends of the United States moved to the rostrum, expressing confidence, praise, and support. Then the vice-minister of health of the Soviet Union took the rostrum. Tension filled the hall and Štampar's grim visage reflected the mood of all who wondered and feared at this moment of crisis for the future of that which had been so carefully constructed for the welfare of all mankind. In the Palais in those days there was no simultaneous translation, but we knew that Dr. Štampar understood Russian and so watched his face keenly for an answer to our fears. As the Russian spoke with force and vigor, and at what seemed interminable length, Štampar's face remained grimly set. There was no look of hope. The Russian, as we discovered later, was giving no quarter but was criticizing the United States for talking of death at a time of birth. Then—a final sentence, and a beam of joy erupted on Štampar's face, telling all of us electrically that the Soviet Union had supported the admission of the United States to the World Health Organization. Our Russian colleague had grudgingly stated that, despite our bad behavior, we were perforce essential to the WHO. It was this message that Štampar transmitted to us and to the delegations throughout that great Assembly Hall without a spoken word. Throughout his life he had had many tense moments, many moments of doubt and fear, yet one can believe that perhaps this was his greatest moment, because it involved not only himself and his family but his great concern for the world and the people in it. And it had come out right for him and for mankind.

Štampar was a man of force and conviction. There were times when we would have been glad to skin the "bear of the Balkans" and hang his hide high on a tree. But there existed always the underlying affection and the deep-seated respect that made us realize that when he was not right he certainly meant to be. Our contacts with him were deep-rooted in friendship and affection.

At home as well as abroad Štampar continued as a leader to the moment of his final illness and death. He had work effectively under the monarchy and under the Tito regime. No one seemed quite to know his politics because perhaps his politics were only people and their needs. His country and his col-

leagues recognized his worth and his greatness, signalizing it by electing him president of the Yugoslav Academy of Science—which is one of the highest distinctions that can come to a man of his country.

Those of us who knew Andrija Štampar have been saddened to learn of his death. Untold millions who have never heard of him have lost a friend who worked for them incessantly and stubbornly, who fought for them valiantly. His name will live in the history of public health.

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When You Write

Writing well calls for hard work. Anatole France used to subject his work to six successive forms of correction, as follows:

1. Enliven the platitudes
2. Weed out the who's, which's, and whom's
3. Shorten sentences. Strike out phrases linking sentences. Make sound transitions of thought instead.
4. Watch the order in sentences: recurrence of the same word means that the sentence should be rewritten, not that a synonym should be used.
5. Take out useless adjectives
6. Clip away pastry, the adventitious, and the redundant

(Alan Gregg. For Future Doctors. 1957, p. 65).

Interest in reducing fetal wastage and neonatal deaths has created a need for firmly established evidence to provide a basis for concrete guidance. This report deals with a pilot study to collect and analyze data on perinatal mortality in three teaching hospitals. Some significant findings are discussed, as well as the use of certain personnel such as medical social workers and nutritionists.

NORTH CAROLINA FETAL AND NEONATAL DEATH STUDY

I—STUDY DESIGN AND SOME PRELIMINARY RESULTS

Henry B. Wells, M.S.P.H.; Bernard G. Greenberg, Ph.D., F.A.P.H.A.: and James F. Donnelly, M.D

THE OVER-ALL OBJECTIVES of this study were "to promote interest in fetal and neonatal mortality; to encourage study of their causative factors; and to assemble information from which conclusions can be drawn that will enable maternal and child health programs to provide concrete guidance in the reduction of fetal wastage and neonatal deaths." [16] The cooperative nature of the study and a more detailed discussion of the objectives have been given by Hunt.[9]

A pilot study was initiated in three teaching hospitals * in North Carolina in the spring of 1954 in order (1) to determine the feasibility of the study design and make revisions where needed; and (2) to improve by actual experience the schedule upon which data were to be recorded.

The pilot study was divided into two phases, the first of which covered about eight months' experience. All data collected during this first phase were analyzed to fulfill the two objectives noted above. The second phase of the pilot study concerned the collection of data covering about 15 months' experience while results of the first phase were being analyzed to revise the schedule, which revision was put into use in the three hospitals in June, 1956. Two previous reports have been made, one covering the 1954 experience,[15] the second covering in a preliminary fashion the 1954 and 1955 experience.[4] The present report discusses more completely the data of the entire pilot study and the methodology.

Study Design

An eight-page study schedule † is completed for every fetal death in which the fetus weighs 400 gm. or more at birth and for every neonatal death (regardless of birth weight or length of gestation) which is born and dies in the participat-

* North Carolina Baptist, Duke, and North Carolina Memorial.

† Sample copies of the current schedule are available on request from North Carolina State Board of Health, Raleigh.

ing hospitals.* A schedule is also completed for each infant in a comparison group, hereafter called "controls," chosen on a random-sampling basis from those who survive at least 27 days after birth. The comparison group is not a control in the usual sense of the word but is referred to as such for convenience. The last two pages of the schedule are for autopsy data only and are not completed for the controls. Controls are chosen randomly on the basis of the terminal digit of the child's hospital file number in two hospitals and the delivery room log book in the other. An infant in the control sample who dies in a study hospital before reaching 28 days of age is automatically transferred to the neonatal group.

This sampling procedure assures that obstetrical staffs can obtain interview information on the controls while the mother is still in the hospital but precludes the possibility of bias in the management of a pregnancy because of prior knowledge that the delivery would be a control case. Sampling proportions for controls vary from 5 per cent for hospitals with low perinatal death rates to 10 per cent for hospitals with high perinatal mortality rates. The actual sampling proportions for controls (Table 1) were somewhat smaller than planned. This might be a result of the fact that there is no way of verifying which births should have been reported as controls without examining the hospital records, whereas deaths not reported are found by matching against the vital records.

The schedule is completed by the obstetrical staff while the mother is hospitalized after delivery. Schedules are submitted monthly to the Public Health Statistics Section of the State Board of Health and a fee of $4 is paid for each schedule completed.

Most items on the schedule are precoded. Each schedule is edited for completeness and internal consistency and is matched against the corresponding vital record(s). When possible, missing data are supplied from the vital record. The hospital is queried for other missing data and for inconsistencies. Finally, the data are transferred to punch cards for processing.

During both phases of the pilot study, schedules of data were completed for the required events in the three hospitals according to the original plan. Altogether, 875 of these pilot schedules were collected from the spring of 1954 to June, 1956. Unless otherwise specified, the results reported in this paper are restricted to the 828 single births among them.

Quality of Basic Data

The three teaching hospitals have about 3,600 deliveries annually, including 90 fetal and 75 neonatal deaths, which are eligible for inclusion in the study. Table 1 shows the estimated number of events, including multiple births, which occurred in each hospital during the pilot period and the actual numbers of each event reported from each hospital. The length of time the pilot schedule was used by each hospital varied slightly because of variations in introducing the revised schedule.

The hospitals differ in the actual procedure for completing the schedules. In hospital A, each obstetric resident is responsible for reporting deliveries which occur while he is on duty. One resident in hospital B is responsible for the completion of all schedules. In hospital C, a laboratory technician usually obtains data requiring interview of the mother after delivery and the remainder of the schedule is completed from the mother's and infant's hospital records by the obstetrician responsible for the mother.

There is also variation among the

* Two additional hospitals have been admitted to the study which is now in its main stage.

Table 1—Expected and Actual Number of Events, Including Multiple Births, Reported by Hospital, Fetal and Neonatal Death Study, North Carolina, March, 1954–June, 1956 *

Hospital	Deaths		Controls	
	Fetal	Neonatal	No.	Per cent of Total
Hospital A:				
Expected	85	58	263	10.0
Actual	92	63	223	8.5
Hospital B:				
Expected	74	73	228	5.6
Actual	71	70	184	4.5
Hospital C:				
Expected	36	28	115	10.0
Actual	40	27	105	9.1

* The period of time each hospital used the "old" schedule varies because of time lags in introducing the new schedule.

hospitals in the types of obstetric patients delivered. For example, one hospital accepts only white patients. Another hospital sees a large proportion of its patients for the first time in labor, as well as those women who receive prenatal care in a local home for unwed mothers. A third hospital gets a larger proportion of difficult, indigent cases referred to it.

The major reason for differences in perinatal mortality rates among these institutions is probably the type of patient delivered, because the quality of obstetric and pediatric care rendered in all three is generally high. The primary difference in the populations of the three hospitals is racial. In analyzing the results of the study as a whole, the controls are therefore weighted more heavily with "bad" risks, because of higher sampling rates in the hospitals with higher perinatal rates. By accounting for race and other covariables in analysis, this source of bias can be removed.

During the first phase of the pilot study, schedules were reviewed with each hospital to correct deficiencies and omissions. Although discussed, no attempt was made to measure the "repeatability" or the consistency of reporting various items on the pilot schedules. This reliability check is being made for the current schedules.

The major deficiency in the schedules collected is missing or unknown data. Certain data were not routinely recorded in the hospital records and therefore were not available unless the mother was interviewed before, during, or after hospitalization. A few of the mothers included in this study could not be interviewed. Other than eating habits, education of the mother was the item most frequently omitted from the schedules. The following items were reported as unknown in 10 per cent or more of the 875 pilot schedules:

Item	Per cent Unknown
Mother's eating habits	
Childhood	42.4
Present pregnancy	40.0
Mother's education	37.9
Height of mother	24.1
Length of fetus	12.1
Weight gain of mother	12.0

In this report, each analysis is based on those observations for which all

variables required in the particular analysis are known. In effect, this means complete loss of an observation or case if any one of the variables needed for a given analysis is not known. The number of observations used, therefore, may vary from one analysis to another. In analyses now under way, these "partial" observations are being utilized by other methods of analysis, but this problem will not be discussed here.

Cases for which data were missing usually were nonwhites in the young age groups and lower socioeconomic class. This limitation as well as others should be kept in mind when considering the results reported here.

Analytical Methods

A. Mathematical Models

The complex interactions of the many factors related to the phenomenon of perinatal mortality make it impractical to analyze conjointly even the "major" factors on the basis of specific death rates. A larger number of events than are reported here would be required in order to obtain reliable estimates of perinatal death rates. More complex methods of analysis applied to relatively small numbers of events can be used to examine this problem.

The outcome of a given pregnancy is completely determined by the combined effects of many known factors and a number of unknown (or possibly unsuspected) factors. The manner in which these factors operate is, at best, only partially known.

In order to analyze the effect of given factors or variables upon some outcome, assumptions regarding the manner in which the variables operate must be made.

Mathematically, the general case can be represented in this situation as follows:

$$Y = f(X_1, X_2, \ldots, X_k)$$

where

- Y is the outcome of pregnancy, i.e., death or survival (or a more detailed classification of outcome, such as age at death),
- X_i is the i^{th} factor or variable which might influence the outcome,
- k is the total number of factors under consideration, and
- f indicates that Y is some function of the k factors.

In a given pregnancy, the outcome and a limited number of the X's can be observed or measured. Other X's are not as easily determined, so that in any real situation the k X's may not all be known. The form of the function f is not known and a plausible assumption must be made. The assumption made will lead to specific methods of analysis. Several models are pointed out below. The reader is urged to refer to the sources cited for details about the conditions for use.

1. In terms of current statistical theory, the model which appears best to represent the actual situation is a multivariate model where some variables are continuous, some are discrete, and others are completely qualitative. The theory for the general case has not been completely developed, although Mustafa [14] has developed it for the case with two continuous normal variables and one categorical variable. He has also indicated how to extend it to the case with k continuous multinormal variables and l categorical variable with a multinomial distribution.

2. Recent theoretical developments for multivariate categorical data [13] provide methods which can be used to analyze data where all variables are categorical. The computations required are relatively simple in some cases. By grouping the continuous variables in the general model, these methods of analysis can be applied to the analysis of data in pregnancy outcome. Cox [3] has recently discussed methods for grouping variables.

3. Another approach to the analysis

of the problem would be through discriminant functions, either linear or nonlinear. Hodges[8] has surveyed the literature in discriminatory analysis.

4. If one or two broad assumptions regarding the functional form of the variables in the outcome of pregnancy are made, the usual regression and analysis of variance technics can be applied in several ways to the solution of the problem.

a. By assigning a suitable scoring scale to the outcome, Y, and holding all X's fixed, the linear model

$$Y = a + \sum_{i=1}^{k} b_i X_i + e$$

can be used to develop an equation for predicting the outcome of pregnancy and where Y and the X's are as in the general model, and,

a is a constant,
b_i is the change in Y due to a unit change in X_i, and
e is a random error associated with a given Y.

For example, Y can be assigned a value of 0 for a perinatal death and 1 for a live birth surviving beyond 27 days. Or, in more detailed fashion, Y might represent the time of death of the infant with respect to either conception or time of delivery. In this case, the data can be considered as censored for those who survive, or, alternatively, a reciprocal transformation of the Y variate is of value both in stabilizing variances and in dealing with the surviving infants.[17]

b. By considering the outcome of pregnancy, Y, as a way of classification and rewriting the linear model in 4a as

$$X_k = a + fF + nN + cC + \sum_{i=1}^{k-1} b_i X_i + e,$$

where F, N, and C take the values

F = 1 for fetal deaths
0 otherwise
N = 1 for neonatal deaths
0 otherwise
C = 1 for a control
0 otherwise,

unbiased estimates of the differences between the $\overline{X}_k$ in the three outcome groups F, N and C can be obtained by use of covariance analyses. Hazel[7] has analyzed a problem of this type. Greenberg[6] discussed the advantages and necessary assumptions for applying covariance analysis, and two works cited herein [1, 18] have one or more chapters devoted to covariance.*

B. Methods Used in This Study

Two methods of analysis have been applied to the data from this pilot study, contingency Chi-square (X^2) and analysis of covariance (4b preceding).

Chi-square tests of association were made to test the association of the various factors studied with the outcome of pregnancy. The statistical significance of a given factor does not in itself indicate a causal relationship but it does indicate that the factor should be investigated further to determine why it is associated with death.

The same argument can be applied to the results of a covariance analysis. However, covariance makes it possible to hold constant the effect of covariables and to obtain a test of the difference between the three outcome groups in the single variable under investigation.

To illustrate how covariance analysis adjusts for imbalance in the covariables, the results for the analysis of mother's age adjusted for education, race, parity, socioeconomic score and parity squared are shown in some detail in Table 2.

The relative positions of the means for mother's age Y ($\overline{X}_k$ in discussion 4b preceding) in the three groups were unaltered in this case, but they were adjusted as follows:

Fetal − 0.96 years
Neonatal + 0.26 years
Control + 0.24 years

* Another recent paper describes this use of covariance. See Cochran, W. G. Analysis of Covariance: Its Nature and Uses. Biometrics 13:261–281, 1957.

Table 2—Means of Mother's Age and Covariables in Analysis of Covariance Example, Fetal and Neonatal Study, North Carolina, 1954–1956

Variable		Deaths: Fetal	Deaths: Neonatal	Controls	Total
Education (yrs.)	(X_1)	10.8558	9.8936	11.5916	11.1375
Race (Proportion white)	(X_2)	0.8558	0.8085	0.8634	0.8519
Parity	(X_3)	2.2981	1.8830	1.4006	1.6673
Socioeconomic score	(X_4)	3.5577	3.9043	3.2702	3.4423
Parity squared	(X_5)	11.7981	7.9894	4.7298	6.7327
Mother's Age (yrs.)	(Y)				
Unadjusted		29.66	25.48	26.10	26.70
Adjusted by covariance		28.70	25.74	26.34	26.70
No. of cases		104	94	322	520

Discussion

Two limitations should be kept in mind in interpreting these preliminary results:

1. The results for a given analysis are based only on known observations, i.e., only the completely known observations are used in this analysis. The characteristics of the "unknowns" are sometimes quite different from those of the "knowns."

2. The specific results cannot be generalized directly to any general population because of the nature of the sample. However, the relationships observed among the variables should be similar to the relationships found in the general population.

The results are presented in Tables 3 and 4. Testing is at the 1 and 5 per cent levels of significance.

The results in Table 3 are classified by race and the inferences might change if the data were adjusted for other factors. None of the significant X^2 tests will be discussed here because most results confirm previous knowledge. Discussion of some of the nonsignificant results, however, is indicated. For example, it was surprising to find that for nonwhites, mother's marital status, pay status, and history of venereal disease were not significantly different among the fetal, neonatal, and control groups.

The nature of the obstetric population in this study has already been discussed and may explain these unanticipated nonsignificant findings. Another explanation may be that these are false negatives, i.e., the outcome groups really are different but because of sampling errors the test of significance did not show this. Also, the effect of marital status may have been nullified for whites because unwed mothers received good prenatal care in a special maternity home before admission to one hospital for delivery. Service-patient or pay status is suggestive for both whites and nonwhites, but only four out of 261 nonwhite patients were private patients. Abnormal pelvis may be nonsignificant because of the small numbers involved, since one hospital reported all pelvis measurements as unknown unless obtained by pelvimetry. Finally, all these findings may be nonsignificant because of the high quality of obstetric care given in teaching hospitals.

Results of the covariance analyses are summarized in Table 4.

Yerushalmy[20] found that stillbirth and neonatal death rates were high for very young fathers, low during the middle of life, and high for older fathers when age

Table 3—Summary of Chi-Square Tests, Fetal and Neonatal Study, North Carolina, 1954–1956

(Number with factor is in parentheses)

Schedule Item No.	Factor Tested	Race	Per cent with Factor			Significance of Observed Differences
			Fetal	Neonatal	Control	
11	Mother not married	White	5.3(6)	6.3(6)	6.7(24)	N.S.
		Nonwhite	27.0(20)	31.1(14)	22.5(32)	N.S.
11	Mother service patient	White	52.6(60)	47.4(45)	43.6(156)	N.S.
		Nonwhite	100.0(74)	97.8(44)	97.9(139)	N.S.
12	History of specified family illness	White	15.7(17)	13.6(12)	19.2(66)	N.S.
		Nonwhite	20.9(14)	16.3(7)	17.3(23)	N.S.
Combination of other items	Lowest socio-economic class	White	28.6(30)	33.0(30)	18.5(64)	H.S.
		Nonwhite	79.3(46)	84.6(33)	60.8(76)	S.
23	History of venereal disease	White	2.7(3)	1.1(1)	0.6(2)	S.
		Nonwhite	18.8(13)	11.9(5)	9.2(13)	N.S.
30	No iron or vitamins during pregnancy	White	15.0(16)	16.7(15)	7.7(27)	S.
		Nonwhite	38.2(26)	34.2(13)	16.3(23)	H.S.
35	Pelvis abnormal	White	0.9(1)	2.2(2)	2.6(9)	N.S.
		Nonwhite	9.1(6)	2.4(1)	6.9(9)	N.S.
38	Present pregnancy conditions	White	55.4(62)	50.5(48)	11.6(41)	H.S.
		Nonwhite	54.1(40)	46.7(21)	21.1(30)	H.S.
39	Present intercurrent illness: I	White	10.0(11)	4.2(4)	3.9(14)	S.
		Nonwhite	12.2(9)	11.1(5)	2.1(3)	S.
40	II	White	9.0(10)	7.4(7)	3.4(12)	S.
		Nonwhite	9.6(7)	2.2(1)	2.8(4)	N.S.
41	III	White	6.3(7)	1.1(1)	9.3(33)	S.
		Nonwhite	13.7(10)	6.7(3)	3.5(5)	S.
42	Nonvertex (anterior and posterior) presentation *	White	55.6(15)	33.7(32)	5.0(18)	H.S.
		Nonwhite	19.1(4)	17.8(8)	5.6(8)	S.
43	Onset of labor other than spontaneous *	White	7.4(2)	13.7(13)	5.9(21)	S.
		Nonwhite	4.8(1)	11.1(5)	7.0(10)	N.S.
44	Rupture of membranes other than spontaneous *	White	18.5(5)	22.5(20)	23.5(82)	N.S.
		Nonwhite	11.1(2)	15.6(7)	15.8(22)	N.S.

* Excludes fetal deaths which were not known to be alive at onset of labor.
S = Significant at 5 per cent level.
HS = Significant at 1 per cent level.
NS = Not significant at 5 per cent level.

Table 3—Continued

Schedule Item No.	Factor Tested	Race	Per cent with Factor			Significance of Observed Differences
			Fetal	Neonatal	Control	
45	Rupture of membranes before 5 cm. dilation of cervix *	White	50.0(13)	45.8(38)	36.7(125)	N.S.
		Nonwite	71.4(15)	63.2(24)	31.1(41)	H.S.
45	Abnormal amniotic fluid *	White	30.8(8)	25.3(21)	2.4(8)	H.S.
		Nonwhite	14.3(3)	7.9(3)	4.6(6)	N.S.
46	Membranes ruptured more than 24 hrs. before onset of labor *	White	7.4(2)	14.6(13)	2.3(8)	H.S.
		Nonwhite	33.3(7)	27.5(11)	3.0(4)	H.S.
47	Membranes ruptured more than 24 hrs. before delivery *	White	18.5(5)	18.4(16)	3.2(11)	H.S.
		Nonwhite	33.3(7)	25.6(10)	4.5(6)	H.S.
48	Mother's intrapartum temperature higher than 99° F *	White	16.0(4)	16.0(15)	7.9(28)	S.
		Nonwhite	33.3(7)	35.6(16)	18.3(26)	S.
52	Fetal distress during delivery *	White	50.0(13)	18.2(16)	2.2(8)	H.S.
		Nonwhite	52.4(11)	9.3(4)	0.7(1)	H.S.
53	First stage of labor longer than 18 hrs.*	White	29.6(8)	9.6(9)	7.3(26)	H.S.
		Nonwhite	23.8(5)	11.9(5)	5.0(7)	H.S.
54	Second stage of labor longer than 2 hrs. *	White	7.4(2)	3.2(3)	7.3(26)	N.S.
		Nonwhite	4.8(1)	5.0(2)	1.4(2)	N.S.
55	Total labor longer than 24 hrs.*	White	18.5(5)	5.3(5)	4.2(15)	H.S.
		Nonwhite	19.1(4)	4.4(2)	5.0(7)	S.
56 & 57	Complication(s) of labor *	White	74.1(20)	23.2(22)	6.7(24)	H.S.
		Nonwhite	57.1(12)	17.8(8)	7.0(10)	H.S.
58 & 59	Nonspontaneous delivery (with or without episiotomy)	White	77.8(21)	45.3(43)	42.2(151)	H.S.
		Nonwhite	57.1(12)	35.6(16)	16.9(24)	H.S.
64	Infant first breathed more than 60 seconds after delivery	White	– –	29.7(27)	4.8(17)	H.S.
		Nonwhite	– –	46.5(20)	2.8(4)	H.S.

* Excludes fetal deaths which were not known to be alive at onset of labor.
– Not applicable.
S = Significant at 5 per cent level.
HS = Significant at 1 per cent level.
NS = Not significant at 5 per cent level.

Table 3—Continued

Schedule Item. No.	Factor Tested	Race	Per cent with Factor			Significance of Observed Differences
			Fetal	Neonatal	Control	
65	Infant first cried more than 60 seconds after delivery	White	– –	45.6(41)	9.8(35)	H.S.
		Nonwhite	– –	70.0(28)	7.0(10)	H.S.
69	Child's condition at birth not normal	White	– –	79.8(75)	6.7(24)	H.S.
		Nonwhite	– –	68.9(31)	6.4(9)	H.S.
70	Placenta and/or cord abnormal	White	54.1(60)	41.3(38)	3.9(14)	H.S.
		Nonwhite	55.2(37)	15.6(7)	2.8(4)	H.S.
71	Congenital malformations diagnosed	White	13.9(15)	19.3(17)	0.6(2)	H.S.
		Nonwhite	5.7(4)	11.1(5)	0.0(0)	H.S.
72	Birth injury diagnosed *	White	33.3(9)	13.2(12)	0.6(2)	H.S.
		Nonwhite	13.6(3)	20.0(9)	1.4(2)	H.S.
73	Other specified conditions diagnosed: I	White	– –	44.4(40)	1.7(6)	H.S.
		Nonwhite	– –	33.3(15)	2.8(4)	H.S.
74	II	White	– –	19.3(17)	0.0(0)	H.S.
		Nonwhite	– –	11.1(5)	0.7(1)	H.S.
76	Diagnosis of blood dyscrasia in infant	White	4.7(5)	6.6(6)	2.5(9)	N.S.
		Nonwhite	5.5(1)	0.0(0)	2.8(4)	N.S.

* Excludes fetal deaths which were not known to be alive at onset of labor.
– Not applicable.
S = Significant at 5 per cent level.
HS = Significant at 1 per cent level.
NS = Not significant at 5 per cent level.

of mother was held constant. Sutherland [19] did not find the same relationship of father's age to stillbirth rates in a similar analysis of New Zealand rates. This discrepancy in findings might be due to differences in definitions of stillbirth between the United States and New Zealand. While the results for father's age here are significantly different among the three groups, this may not be so when mother's parity is also included as a covariable.

Mother's age was discussed in the example under the discussion of the method of covariance.

The average number of years of education of mother, adjusted for race and income level of father, was 10.9, 10.4 and 11.4 for the fetal, neonatal, and control groups, respectively. The extra year of education for the control mothers was significant. The relatively high educational levels of all three groups is due to a disproportionate number of professional and student wives in the study population.

Yerushalmy [21] estimated that long and short intervals between births resulted in increased perinatal death rates, while an intermediate interval resulted in the lowest rate. Douglas [5] reported a higher incidence of premature birth for both very close and very long spacing of births. The present study indicates that

Table 4—Summary of Covariance Analyses, Fetal and Neonatal Death Study, North Carolina, 1954–1956

Analysis No.	Factor Tested	Adjusted for	Adjusted Means*			Significance Level
			Fetal	Neonatal	Control	
1	Father's age (years)	Mother's age, mother's age squared, and socioeconomic class	31.1 (159)	29.6 (125)	30.2 (461)	S.
2	Mother's age (years)	Mother's education, race, parity, parity squared, and socioeconomic class	28.7 (104)	25.7 (94)	26.3 (322)	H.S.
3	Mother's education (yrs.)	Occupation of father and race	10.9 (105)	10.4 (94)	11.4 (322)	H.S.
4	Mother's diet score	Race and socioeconomic class	8.00 (94)	7.86 (80)	8.22 (265)	N.S.
5	Parity	Mother's age, race, and socioeconomic class	2.16 (163)	1.93 (130)	1.97 (470)	N.S.
6	Average number of previous perinatal deaths	Not adjusted	0.52† (163)	0.51† (130)	0.26† (470)	Not tested
7	Birth interval (years) of multiparae	Parity, previous immature fetal deaths, and socioeconomic class	3.38 (112)	2.26 (88)	2.59 (302)	H.S.
8	Height of mother (inches)	Race and socioeconomic class	64.3 (131)	64.5 (109)	64.0 (379)	N.S.
9	Gestation period (weeks)	Mother's age, race, parity, and socioeconomic class	34.3 (163)	32.4 (130)	39.9 (470)	H.S.
10	Birth weight (grams)	Not adjusted	2,119† (162)	1,793† (129)	3,315† (470)	Not tested
11	Prenatal care score	Socioeconomic class and length of gestation	64.3 (158)	69.9 (124)	62.8 (468)	N.S.

* The means are adjusted for difference in the variables indicated in the previous column. The number in parentheses represents the number of observations upon which the mean is based.

† A single regression equation could not to be used to adjust these means; therefore, these are unadjusted means.

S = Significant at 5 per cent level.
HS = Significant at 1 per cent level.
NS = Not significant at 5 per cent level.

even with the same parity, number of previous immature fetal deaths, and socioeconomic status, the interval since the previous pregnancy was 2.3 years for neonatal deaths, 2.6 years for controls, and 3.4 years for fetal deaths on the average. This does not mean that the long and short intervals of Yerushalmy corresponded to fetal and neonatal death but that fetal deaths occurred among mothers who had a longer interval between the latest and the previous conception. This is confirmed in the following tabulation, which shows the percentage distribution of multiparas in each outcome group by birth interval for this study:

Interval Years	F	N	C
Under 1	3.8	8.5	2.2
1–3	63.9	77.6	73.2
4 or more	32.3	13.9	24.6

Fetal deaths are more frequent than controls for both long and short intervals,

while neonatal deaths occur most often after short or intermediate intervals.

Gestation periods were based on reported date of last menstrual period and need no discussion per se except that the covariables used in analysis No. 11 (Table 4) account for only 2 per cent of the total variation in length of gestation. However, Martin [12] has suggested that variation in the length of pregnancy is less for better educated woman. The hypothesis that there was no such difference was formulated, and estimated variances by outcome group were computed for two educational levels: (1) those with only seven and eight years of school and (2) those with four or more years of college. While there were no significant differences in variance in length of pregnancy between these two educational levels among the fetal and neonatal cases, there was a significantly larger variance in length of pregnancy for the lower educational level than for the higher level among the controls (Table 5).

The regression curves expressing the relationships of (1) number of previous perinatal deaths to mother's age, mother's parity, and socioeconomic class; and (2) birth weight to race, parity, previous perinatal deaths, socioeconomic class, and length of gestation were different in the fetal, neonatal, and control groups. Therefore, covariance adjustments could not be made in these two analyses (numbers 6 and 10 in Table 4). In reference to birth weight, the five covariables account for a large proportion of the variation in birth weight of fetal and neonatal deaths but for very little of the variation in birth weight of surviving infants. The number of surviving prematures in this phase of the study has been too small to attempt an explanation of why this has occurred.

It was difficult to get diet information on schedules from one hospital, and the unknowns were eliminated from analysis No. 6. The controls showed a slightly higher score than the deaths, although the difference is not significant.

The nonsignificance of parity when adjusted for mother's age, race, and socioeconomic status is perhaps the most surprising result of this study. It certainly indicates that the importance of parity per se should be examined more closely for significance in perinatal death. Possibly the other covariables are the more important causal factors. Parity has correlation coefficients of about 0.58 and 0.47 with age of mother and socioeconomic status respectively.

Another surprising result is the nonsignificance of mother's height, in view of the results of some English studies.[2, 10] The results of this study are possibly

Table 5—Estimated Variance in Length of Pregnancy in Weeks by Outcome and Education of Mother, Fetal and Neonatal Death Study, North Carolina, 1954–1956

(Numbers in parentheses are degrees of freedom for the estimate)

Outcome	Education		Significance of Observed Difference
	Completed Only 7th or 8th Grade	College Degree or Graduate Work	
Fetal	33.24(14)	47.92(12)	N.S.
Neonatal	46.66(15)	42.13(7)	N.S.
Control	10.97(30)	4.07(56)	H.S.

NS=Not significant at 5 per cent level.
HS=Significant at 1 per cent level.

biased by the large proportion of unknown heights or by errors in reporting. Or, height differences in this country may be more genetic and less environmental than among the English mothers studied. The nonsignificance of quality of prenatal care is not surprising in view of two other recent English studies.[11, 13]

Recommendations for Similar Studies

1. To reduce unknown or missing data to a minimum, provision should be made for a nurse or medical social worker and/or a nutritionist to interview mothers either in the hospital or at home. Physicians should be held responsible for completing the medical sections of a study schedule.

2. Early and continuous editing should be done on a current basis where possible.

3. The consistency of reporting should be evaluated by asking participants to complete duplicate schedules on a number of cases.

4. Further investigation of the reasons for differences in relationship of variables in perinatal death and in surviving infants is needed to determine whether the relationships are similar in the various stages of pregnancy. For example, is the regression of birth weight on race, parity, history of previous perinatal death, socioeconomic class, and gestation the same for surviving small prematures as for small prematures who die?

Summary

The design of a cooperative perinatal mortality study is discussed. All perinatal deaths and a sample of surviving infants born in participating hospitals are included. The results were analyzed and tested by contingency Chi-square and analysis of covariance. Some of the significant factors in death, after adjusting for several covariables, are:

1. Lower educational levels of mothers
2. Older and younger mothers
3. Long and short birth intervals
4. Length of gestation

Some factors which were not significant, after adjustment for important covariables, are:

1. Mother's diet score
2. Parity
3. Height of mother
4. Prenatal care

Among control infants only, length of gestation data based on date of last menstrual period are more variable for lower educational levels than for higher ones. A possible explanation is that the date of last menstrual period is less reliable for the lower educational levels.

The factors of race, parity, previous perinatal death, socioeconomic class and gestation period account for much of the variation in birth weight of fetal and neonatal deaths but for relatively little of the variation in birth weight of those who survive the neonatal period.

The experience in this study suggests that in similar studies more use be made of medical social workers and nutritionists and that the dissimilarities between perinatal deaths among premature infants and premature survivors be studied more intensively.

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Is rheumatic fever still an important public health problem? The results of the survey reported in this article indicate that in Minnesota rheumatic fever is far more prevalent than is indicated by the figures reported to the State Health Department. The implications for the control of this serious disease are far-ranging and merit serious thought.

CHILDREN WITH RHEUMATIC FEVER IN MINNESOTA

A. B. Rosenfield, M.D., M.P.H., F.A.P.H.A.

IN RECENT years, a growing feeling has developed among physicians that rheumatic fever has been declining so markedly in frequency that it no longer constitutes a serious health problem. During the five-year period, 1950 through 1954, an average of 187 cases a year has been reported to the Minnesota Department of Health. While reporting of this dease is required by law, it is well known that such reporting is quite incomplete. Therefore, accurate information on the prevalence of rheumatic fever is still lacking. To obtain accurate current information, the Heart Committee of the Minnesota State Medical Association, in cooperation with the Minnesota Heart Association and the Minnesota Department of Health, undertook a statewide survey to provide some of these data.[1] A simple questionnaire was mailed in September of 1955 to the 3,063 members of the Minnesota State Medical Association, who represent most of the physicians in the state. Of the 1,519 replies remaining after exclusion of 37 out-of-state reports, representing a total return of 50.8 per cent, 597 physicians reported treating 2,297 cases of rheumatic fever during the 12-month period of the study (Table 1). This represents an average of 3.8 cases per physician reporting cases. On the basis of this 50 per cent return, it would appear probable that more than 4,000 cases were treated by physicians during the year.

Contrasting the large number of cases of rheumatic fever reported in the survey with the small number of cases reported to the Minnesota Department of Health during the same period, two questions were raised by the Rheumatic Fever Survey Committee. First, how many actual cases existed among the 2,297 cases reported in the survey? Second, how many of the cases met generally accepted diagnostic criteria for rheumatic fever? To answer these questions a follow-up study was carried out by visiting an 11 per cent sample of the physicians who handled 13 per cent of the cases.[2] Each physician in the follow-up study was interviewed by appointment, his case records were reviewed and the data abstracted on a check list, using Jones' criteria for diagnosis (Table 2).[3] Among the 65 physicians in-

Table 1—Questionnaire—Reported Cases of Active Rheumatic Fever, by Type of Practice, Minnesota, 1955

Type of Practice	Questionnaires Returned		Positive Replies		No. of Cases	Average per Physician	Per cent of Total Cases
	No.	Per cent	No.	Per cent			
Internist	173	11.4	73	42.2	258	3.5	11.2
Pediatrician	62	4.0	45	72.6	242	5.3	10.5
General practitioner	707	46.6	456	64.5	1,725	3.8	75.1
Surgeon	166	10.9	12	7.2	48	4.0	2.1
Other	411	27.1	11	2.7	24	2.1	1.1
Total	1,519	100.0	597	39.3	2,297	3.8	100.0

terviewed were 15 internists, seven pediatricians, 41 general practitioners, and two surgeons, who had reported a total of 281 cases of rheumatic fever.

Of the 281 cases originally reported by these physicians, only 225 (or 80 per cent) could be individually identified as actual cases on the basis of the doctor's records or interview. By applying Jones' criteria to the 225 cases actually seen by the physicians, it was found that 202 or (90 per cent) qualified and 23 cases (10 per cent) did not qualify as true cases of rheumatic fever (Figure 1). These were about equally divided as to sex, there being 113 males and 112 females. Of the 225 cases, 152 (or 68 per cent) occurred in children under 15 years of age. On the basis of the follow-up study, which was statistically designed to confirm or revise the figure of 2,297 cases originally reported in the survey, it appears that the physicians who returned the questionnaires actually treated in one year more than 1,650 patients with rheumatic fever, two-thirds of whom were under the age of 15 years. Since only half the physicians of the State Medical Association returned questionnaires, the number of cases could be doubled, to reveal that probably more than 3,000 cases were treated during the year.[4] Of these, about 2,000 were among children under 15 years of age.

This conclusion as to the marked prevalence of the disease raised another question. Of the 1,519 questionnaires returned, which represented a 50 per cent return, 597 physicians (or 39 per cent) reported cases of rheumatic fever; 922 physicians (or 61 per cent) reported that they treated no cases. Is it then

Table 2—Physicians Visited, by Type of Practice and Reported and Actual Cases. Follow-Up Study of Physicians Who Answered Questionnaires

	No. of Physicians	No. of Reported Cases	No. of Actual Cases	Per cent of Actual to Reported Cases
Internist	15	35	30	86
Pediatrician	7	68	46	68
General practitioner	41	173	144	83
Surgeon	2	5	5	100
Total	65	281	225	80

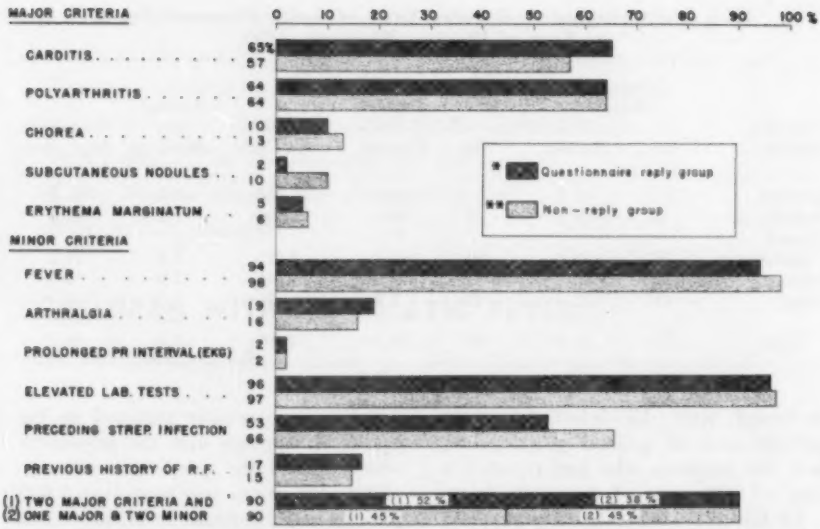
MAJOR CRITERIA
0 10 20 30 40 50 60 70 80 90 100 %
CARDITIS 65% 57
POLYARTHRITIS 64 64
CHOREA 10 13
SUBCUTANEOUS NODULES 2 10
ERYTHEMA MARGINATUM 5 6
MINOR CRITERIA
FEVER 94 98
ARTHRALGIA 19 16
PROLONGED PR INTERVAL (EKG) 2 2
ELEVATED LAB. TESTS 96 97
PRECEDING STREP. INFECTION 53 66
PREVIOUS HISTORY OF R.F. 17 15
(1) TWO MAJOR CRITERIA AND (2) ONE MAJOR & TWO MINOR 90 90
(1) 52 % (2) 38 %
(1) 45 % (2) 45 %
* Questionnaire reply group
** Non-reply group

Figure 1—Jones' Major and Minor Criteria: Applied to Follow-Up of 225 Cases of Physicians Who Returned Questionnaires *; Applied to Follow-Up of 177 Cases of Physicians Who Did Not Return Questionnaires **

valid to assume that the 50 per cent who did not reply to the questionnaires treated cases in exactly the same proportion as those who replied? Or did these physicians ignore the questionnaires because most of them treated no cases at all during the year?

To answer this question a second follow-up was subsequently carried out by visiting a 16 per cent sample of the 1,507 physicians who failed to return their questionnaires. This sample totaled 240 physicians selected as to type of practice in approximately the same proportion as those who had returned the questionnaires in the mail survey in order to obtain an objective cross-section of the nonreporting group. Thus, inter-

Table 3—Cases of Active Rheumatic Fever, by Type of Practice, Second Rheumatic Fever Follow-Up Study, Physicians Who Did Not Return Questionnaires

	Physicians Visited		No. and Per cent With Cases			Average	
	No.	Per cent	No.	Per cent	No. of Cases	per Physician	Per cent of Total Cases
Internist	28	11.7	12	43.0	20	1.7	11.3
Pediatrician	10	4.1	5	50.0	13	2.6	7.4
General practitioner	105	43.8	51	48.6	137	2.7	77.4
Surgeon	30	12.5	5	16.7	5	1.0	2.8
Other	67	27.9	1	1.5	2	2.0	1.1
Total	240	100.0	74	30.8	177	2.4	100.0

views were obtained with 28 internists, 10 pediatricians, 105 general practitioners, 30 surgeons, and 67 "others" (Table 3). The "other" physicians were mostly eye, ear, nose and throat specialists, dermatologists, psychiatrists, urologists, orthopedic surgeons, obstetricians, gynecologists and radiologists. On a statewide basis, this "other" group constitutes almost 30 per cent of Minnesota's physicians who would not normally diagnose or treat rheumatic fever. This, then, may be one of the factors that has contributed to the impression among physicians that rheumatic fever is no longer a serious problem.

Of the 240 physicians visited who had not returned questionnaires, 74 (or 30.8 per cent) had treated 177 cases of rheumatic fever. Of the physicians who returned the questionnaires, 39.3 per cent reported cases. Based on these findings, 8.5 per cent more of the physicians answering the questionnaires treated cases of rheumatic fever than did physicians not answering the questionnaire.

A comparison of Tables 1 and 3 will show that about the same percentage of internists treated rheumatic fever, whether or not they returned the questionnaires (42.2 and 43 per cent). Among pediatricians, however, 72.6 per cent of those returning questionnaires had seen cases, in contrast to only 50 per cent of the pediatricians interviewed in the follow-up of those who failed to answer the questionnaire. Among general practitioners there were 64.5 per cent with cases in the questionnaire group but only 48.6 per cent in the follow-up of the nonreply group. This situation was reversed among surgeons, where there were 7.2 per cent with cases among those who returned the questionnaires, but 16.7 per cent, or more than double, among those who did not return the questionnaires. Many of this last group, however, actually are general practitioners in addition to being surgeons.

The first follow-up study indicated that only 80 per cent of the originally reported cases could be individually identified as actual cases. The questionnaire returns showed that rheumatic fever patients were seen during the year on an average of 3.8 per physician. This should then actually average only three per physician, allowing for the 20 per cent over-reporting estimated. In the follow-up study of the nonreply group it was found that the average number of cases for the year was 2.4 per physician.

By applying Jones' criteria to the 177 cases seen by physicians in the nonreply follow-up, it was found that 158 (or 90 per cent) qualified and 19 cases (10 per cent) did not qualify as true cases of rheumatic fever (Figure 1). Carditis occurred in 57 per cent of the cases in the nonreply follow-up, in contrast to 65 per cent in the reply group. Polyarthritis occurred in about two-thirds of the cases in both groups. Chorea occurred in 13 per cent of the cases in the nonreply group and in 10 per cent of the cases in the reply group. A previous history of rheumatic fever was reported in 15 per cent of the cases in the nonreply group and in 17 per cent of those in the reply group. There were some differences in the percentage of cases which met individual major and minor criteria as between the two groups, but 79 cases, or 45 per cent, met two major criteria, and the same number met one major and two minor criteria of Jones. Thus, exactly the same percentage of cases qualified as accepted cases of rheumatic fever (90 per cent) in both groups.

Deducting the 10 per cent of cases that did not meet Jones' criteria, the 1,507 nonreporting physicians may be estimated to have treated approximately 1,000 cases. This is slightly less than two-thirds the number of cases finally estimated from the original questionnaire and follow-up of the group of 1,519 reporting physicians. With regard

to sex, two-thirds of the cases (112) were males and one-third (65) were females in the nonreply group. This finding contrasts with that of the reply follow-up where males and females were about equal. Of these nonreply cases, 114, or 64 per cent occurred in children under 15 years of age. In the reply follow-up, this age group accounted for 68 per cent. In both groups, three-fourths of the cases were treated by general practitioners and about 20 per cent by internists and pediatricians.

The follow-up of nonreply physicians indicated that the estimate of 3,000 cases based upon the replies received from the original questionnaire and subsequent follow-up should be revised downward only slightly. This study indicates, therefore, that Minnesota had more than 2,600 cases of rheumatic fever diagnosed and treated in 1955, of which about 1,800 were in children under the age of 15. This estimate, based on planned surveys and follow-ups, contrasts sharply with the total of 187 cases reported annually to the State Department of Health.

Summary and Conclusions

A survey of the cases of rheumatic fever treated by the 3,063 members of the Minnesota State Medical Association resulted in a return of 50.8 per cent of the questionnaires, with 597 physicians reporting 2,297 cases of rheumatic fever in a 12-month period. Since only an average of 187 cases a year have been reported to the State Department of Health, and since most physicians feel that the incidence has been declining, questions were raised as to the validity of the survey findings.

A follow-up study by personal interviews and a review of the medical records of 11 per cent of physicians who had reported 13 per cent of the cases in the survey, showed that 80 per cent of the cases reported on the questionnaires represented identifiable cases of rheumatic fever. Of these cases, 10 per cent failed to meet Jones' criteria. On the basis of these findings, there were apparently about 1,650 acceptable cases of rheumatic fever in the questionnaire returns rather than the 2,297 cases reported by 50 per cent of the physicians answering. Interpolating these figures for the total number of physicians in the state, it would appear that Minnesota physicians probably treated about 3,000 patients with rheumatic fever in a 12-month period. Two-thirds of these, or about 2,000 patients, were under 15 years of age.

To test the validity of the assumption that the 50 per cent of the physicians who failed to return the questionnaires had diagnosed and treated rheumatic fever in the same relative numbers as had those who did complete the questionnaires, a second follow-up was made by visiting a 16 per cent sample of the 1,507 physicians in this nonreporting group; 240 physicians were interviewed and their case records were reviewed. They were selected in about the same proportion as to type of practice as were those in the group who returned questionnaires. Of the sample, 74 physicians, or 30.8 per cent, treated 177 cases of rheumatic fever. According to Jones' criteria, 90 per cent of these qualified as true cases of rheumatic fever. This was the identical percentage found in the reply group, although there were differences in the percentages of individual major and minor criteria as between groups.

The follow-up of the reporting physicians indicated that 50 per cent of them treated about 1,650 cases of rheumatic fever. The second follow-up of the nonreporting physicians (the 50 per cent who did not reply to the questionnaire), indicated that this group treated approximately 1,000 cases. There were therefore more than 2,600 cases of rheumatic fever treated in 1955, rather than

the 3,000 estimated on the basis of the replies from 50 per cent of the physicians who answered their questionnaires. It is of interest that three-fourths of all cases were diagnosed and treated by general practitioners. Two-thirds of all cases of rheumatic fever, or approximately 1,800 cases, occurred in children under the age of 15.

This study, then, clearly reveals that rheumatic fever continues to be a prevalent disease and constitutes a serious problem in Minnesota, especially in children. This means that physicians as well as the public must be made aware of the necessity for early diagnosis and treatment and of the importance of long-term prophylaxis.

ACKNOWLEDGMENT—The field work for this study was conducted by Dr. A. C. Erlanson, formerly pediatric consultant, Section of Maternal and Child Health, Minnesota Department of Health, Minneapolis, Minn.

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University of Cincinnati Industrial Health Training

The Institute of Industrial Health of the University of Cincinnati announces graduate courses and fellowships in industrial medicine. A three-year course for physicians leads to the degree of doctor of science in industrial medicine, the third year of which is an approved residency in industry. Eligible are physicians who have completed one year of internship. For the academic year which begins in July, 1959, applications should be received by January 15. Stipends for the first year are $3,000 for unmarried, $3,600 for married candidates; for the second year, $3,400 and $4,000, respectively.

The Institute also offers graduate work in industrial health to graduates of approved schools of engineering or science. A one-year course leads to the master of science degree in industrial health, a three-year course with a dissertation leads to the doctor of science degree. Some fellowships are available to doctoral degree candidates. Stipends begin at $3,000 and $3,600 for unmarried and married candidates to $3,800 and $4,400, respectively, for the third year. Applications for admission and fellowship for the academic year 1959–1960 should be made by May 15.

In each case case queries should be addressed to the Institute of Industrial Health, Kettering Laboratory, Eden and Bethesda Avenues, Cincinnati 19, Ohio.

Working mothers make necessary special child care facilities, such as nursery schools, day care centers, and foster homes. What is the role of the municipal health department in supervising these facilities? This survey throws light on this problem and indicates some areas for further study.

A SURVEY OF THE MUNICIPAL SUPERVISION OF CHILD CARE FACILITIES

Fern Holderfield Curran, R.N.

DURING THE past decade, socioeconomic changes in the United States have made it necessary for an increasing number of mothers to become full-time wage earners. The children of these mothers are usually taken care of in such specialized institutions as day care centers, nursery schools, and foster homes. These institutions afford children an opportunity for physical, intellectual, and social growth and development. A review of the literature on municipal policies governing day care centers, nursery schools, and foster homes revealed the need for more information on the management of these institutions.

Since these institutions are usually supervised in large cities by health department personnel, the health departments in 22 cities were sent a questionnaire on their policies governing these institutions. The cities were chosen on a representative basis, keeping in mind their size and geographical location. Sixteen states, plus the District of Columbia, were selected for this survey. Eighteen cities responded to the questionnaire.

The following cities were asked to participate in this survey:

Atlanta, Ga.	Minneapolis, Minn.
Austin, Tex.	New Haven, Conn.
Baltimore, Md.	Newark, N. J.
Chicago, Ill.	New York, N. Y.
Cincinnati, Ohio	Oakland, Calif.
Denver, Colo.	Philadelphia, Pa.
Fort Worth, Tex.	Richmond, Va.
Houston, Tex.	San Antonio, Tex.
Kansas City, Mo.	Seattle, Wash.
Los Angeles, Calif.	St. Louis, Mo.
Milwaukee, Wis.	Washington, D. C.

Method

A form consisting of 10 questions was sent to the 22 cities listed. The questionnaire comprised the following questions:

1. Do you have an ordinance regulating day care centers, nursery schools, and foster homes?
2. If not, is there a state law?
3. What department of the city government is responsible for enforcement of the local ordinance or state law?
4. If in the health department, what division or divisions are responsible for enforcement of services?
5. If you have this service, is it carried out by a person as a specialized assignment or position?
6. If the service is generalized, is it carried out by nurses, sanitarians, or others?

7. Does your department employ a social worker?
8. Does your department employ a nutritionist?
9. If so, do the social worker and the nutritionist participate in this program?
10. Would you be interested in the results of this survey?

Results

	No. of Replies		Percentage of Replies	
	Yes	No.	Yes	No.
Question No. 1				
Day care centers	11	7	60	40
Nursery schools	11	7	60	40
Foster homes	9	9	50	50
Question No. 2				
Day care centers	6	1	86	14
Nursery schools	6	1	86	14
Foster homes	8	1	89	11
Question No. 3				
1. a. City health department only	9		50	
b. City health department in conjunction with other health enforcement agencies	4		22	
2. No enforcement	4		22	
3. Qualified answer	1		6	
Question No. 4				
1. a. Nursing only	2		11	
b. Nursing in conjunction with other health enforcement agencies	7		39	
2. Other city departments (children's bureau, division of day care and foster homes and sanitation)	4		22	
3. a. Qualified reply on enforcement	3		17	
b. No enforcement	1		6	
4. No answer	1		6	

Question No. 5

Assignment			Percentage of Replies		
Yes	No	No Answer	Yes	No	No Answer
6	10	2	33	56	11

Question No. 6	No. of Replies	Percentage of Replies
1. Nurses	1	6
2. Sanitarians	5	28
3. Others:		
a. Nurses and physicians	1	6
b. Nurses and sanitarians	1	6
c. Sanitation, nursing, and fire departments	1	6
d. Sanitation, fire, and building inspection	1	6
e. Not generalized *	6	33
f. Not answered	2	11

* This service was carried out by a specialist.

Question No. 7

No. of Replies			Percentage of Replies		
Yes	No	No Answer	Yes	No	No Answer
9	8	1	50	44	6

Question No. 8

No. of Replies		Percentage of Replies	
Yes	No	Yes	No
6	12	33	67

	No. of Replies		Percentage of Replies	
	Yes	No	Yes	No
Question No. 9				
Social worker participating	3	15	17	83
Nutritionist participating	4	14	22	78

Question No. 10

No. of Replies		Percentage of Replies	
Yes	No	Yes	No
17	1	94	6

Discussion

With the exception of one city, all the reporting cities had either local ordinances or state laws governing these institutions.

One-half of the reporting cities stated that their health departments are directly responsible for the enforcement of their ordinances or state laws.

Four health departments enforced these ordinances in conjunction with other health enforcement agencies; enforcement in one of these cities was by county officials, although there was a city ordinance regulating these institutions. Another city reported that the health department is responsible for enforcement of the ordinance, while the public welfare department is responsible for enforcement of the state law regulating foster homes. A third city reported that the division of health enforces the city ordinance and certifies commercial foster homes for state licenses. The fourth city reported that the health department, the fire department, and the building inspection division were responsible for enforcement of laws.

In the four cities providing no enforcement, one city stated that there was voluntary cooperation with the state department of welfare in its licensing program. Two cities stated that there was no local enforcement except by their respective state departments of public welfare, while the fourth city stated that in its division of health, the department of health and welfare cooperated with the state department of education in approval and supervision of these institutions.

Enforcement of laws and regulations governing these institutions can probably be carried out most expediently on a local level in cooperation with state officials. Inspection and supervision on a local level probably provide a more consistent and frequent interpretation of local ordinances and state laws.

In 50 per cent of the replying cities the nursing division is concerned directly or indirectly in enforcement of services. Nurses can offer assistance in maintaining health programs in these institutions by their special training in health education.

In four cities, bureaus or divisions, other than nursing, are responsible for enforcement of services. These are the children's bureau, the division of day care and foster homes, and the division of sanitation.

Three cities gave a qualified reply on enforcement by their health departments. In one city sanitarians inspected prem-

ises for sanitary environment; another city stated that the food section was responsible for enforcement of services. In a third city, the sanitarians also made the inspections, but the physicians of the department and nurses acted as consultants when requested.

Where a city reported that the inspection and supervision of day care centers, nursery schools, and foster homes were not carried out in their entirety by specialized personnel, it was considered as having a nonspecialized service (generalized service). For example, one city reported having one worker assigned to family foster home service, but day care centers and nursery schools were supervised by nonspecialized personnel.

Unless sufficient specialized personnel are available, the supervision and inspection of these institutions can probably be performed most expeditiously under a generalized program, which calls for cooperation among nurses, physicians, nutritionists, social workers, and sanitarians.

While in one city nurses alone are conducting the inspection and supervision of these institutions under a generalized program, they are cooperating with other personnel in this capacity in 24 per cent of the cities reporting. Because of their experience in public health problems, nurses should be utilized on a much broader scale than is shown by the results of this survey.

Sanitarians alone were enforcing a generalized program in 28 per cent of the survey cities; however, they cooperated with other personnel in 46 per cent of the reporting cities.

One-half of the cities surveyed found services of the social worker to be of value to their departments, while 46 per cent reported that a social worker was not employed.

One-third of the cities surveyed employed nutritionists, while 67 per cent did not have nutritionists in their departments.

Of the nine cities employing a social worker, only three used their services in this program; and of the six cities employing nutritionists, four were using their services in this program. In some cases a social worker and a nutritionist should be included in initial or subsequent visits to day care centers, nursery schools, and foster homes because problems are often present which require their special training.

The majority of the replying cities (94 per cent) were interested in the results of the survey. This response shows that almost all cities are interested in knowing how other cities are handling child care facilities.

In order to afford children an optimum environment for physical, intellectual and social growth and development, there should be greater uniformity of supervision of child care facilities. The local health officer should delegate authority to one responsible individual who could correlate the services and activities of specialists and nonspecialists so as to promote an optimum environment. All professional services in a community should be utilized to their maximum and specific responsibilities should be assigned to those capable of improving child care facilities.

Summary

1. A questionnaire was sent to the health departments of 22 cities concerning their policies for regulating and supervising day care centers, nursery schools, and foster homes. Represented in this survey were 16 states and the District of Columbia. Of these cities, 82 per cent replied to the questionnaire.

2. Of the replying cities, 33 per cent had personnel specialized in the inspection and supervision of these institutions; 56 per cent answered that the program was carried out by nonspecialized personnel (generalized program), while 11 per cent did not reply to this question.

3. In 50 per cent of the cities represented in this survey, nurses were found to be active alone or in cooperation with personnel from the municipal departments in the inspection and supervision of day care centers, nursery schools, and foster homes.

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Mrs. Curran is on the staff of the Division of Public Health Nursing, City Health Department, Dallas, Tex.

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Pilot Continuation Education Course

In Louisville in January a first pilot continuation education course for public health physicians is taking place. Inspiring it was the Health Officers Section of the American Public Health Association. Additional sponsors are the Association's Committee on Professional Education, the Association of Schools of Public Health, the American College of Preventive Medicine, and the Association of State and Territorial Health Officers. Representatives of the Health Officers Section in planning the course are: William P. Richardson, M.D., North Carolina School of Public Health, and C. Howe Eller, M.D., Department of Community Health, University of Louisville School of Medicine. The former is chairman of the planning committee.

The week's course is being built around the theme of "Health Officer Leadership in Developing a New Community Health Program." Leaders in the discussion of chronic disease programs will be Paul Q. Peterson, M.D., and Wilfred D. David, M.D., Public Health Service; of medical care, S. J. Axelrod, M.D., University of Michigan School of Public Health; of environmental sanitation, Harry G. Hanson, director, Taft Sanitary Engineering Center; of business management, Earl O. Wright, Ohio State Health Department. Social Science representatives on the faculty, with particular reference to human relations, are Paul Lemkau, M.D., of the Johns Hopkins School of Hygiene and Public Health, and Sol Levine of the Harvard School of Public Health.

There is a plan for evaluating the course through a comprehensive questionnaire to be answered by the students, through faculty impressions, and through follow-up as to results. It is hoped that this pilot effort, supported by the National Foundation and the American College of Preventive Medicine, will develop the principles and procedures which other agencies such as the schools of public health may use in developing continuing programs of continued education.

The course will begin Sunday evening, January 18, with a dinner and social hour and will end at noon on Friday, January 23. Meeting place is Brown's Motel. Tuition is $50. Dr. Richardson, mentioned above, is the person to receive admission applications.

This report presents preliminary morbidity data from a study of the effects of improved housing on physical and mental health. Eighteen months of rehoused experience reveals no gross difference in physical morbidity between test and control families; possible explanations are offered.

THE EFFECTS OF HOUSING QUALITY ON MORBIDITY

PRELIMINARY FINDINGS OF THE JOHNS HOPKINS LONGITUDINAL STUDY

Daniel M. Wilner, Ph.D.; Rosabelle Price Walkley; Marvin N. Glasser, M.P.H.; and Matthew Tayback, Sc.D., F.A.P.H.A.

OUR PREVIOUS papers reported the general plans for the longitudinal study of the effects of housing quality on physical and mental health and social adjustment of 1,000 families in a large eastern city.[1, 2] We also outlined some of the problems met in organizing and carrying out a study such as this that depended for its success on such matters as the proper matching of test and control groups, the exercise of control over the quality of the data being collected, and on protecting the sample from attrition over time.

In the present paper we describe briefly our method, indicate how successful our matching has been, and present the basic preliminary test-control morbidity findings for the first 18 months of rehoused experience of the test families. We discuss the meaning of these data and indicate what secondary analysis is being pursued at present. We conclude with data on the losses incurred to date in our sample, the attendant possibilities of bias in these losses, and some facts concerned with the unanticipated high moving rate of our control families.

Selecting Test Families and Matching Control Families

From April, 1955, to March, 1956, the newly constructed housing development with which we are concerned was occupied gradually by approximately 800 families who moved from housing of generally poor quality. The plans for the study called for the selection of 400 of these families as a test group. This was accomplished through the cooperation of the local Housing Authority. As lists of successful applicants were drawn up, month after month, the study staff selected a proportion, usually half, plus a safety factor of 20 to 30 per cent, as test families. A number of criteria were used for inclusion of a listed family in the test group, the principal ones being (a) the likelihood of finding matching families from our control reservoir and (b) the probability that once chosen the possible controls would remain in the control group. As the test families were chosen, interviews were conducted in the home to obtain initial measures of housing quality, morbidity, and adjustment. It is important

to note that initial measurement was made prior to the move to the new housing, and in fact prior to the Housing Authority's notifying the family that an apartment was available.

Control families were chosen from the large residue of applications on file at the Housing Authority. While selection of the test families was going on, control families were selected, and matched as well as possible pair by pair with the individual test families in terms of 13 variables which we believed played a role in health and adjustment. The initial matching variables were limited to demographic items appearing in the applications on file. The plans for the study called for 600 control families, some test families receiving single matches, and some, double matches. Initial measurements were made on the control families using instruments identical with those administered to the test families.

At the time of the first of our series of "after" measurements in April and May, 1956, the study sample consisted of 396 test families who had moved to the housing development from housing of generally inferior quality and 633 control families who were still occupying generally inferior housing.

The initial interview was intended first, to obtain exhaustive information about the initial comparability of our two groups, not only on demographic variables but also on the dependent variables themselves; and second, to establish certain base lines from which to measure changes. The initial interview included, therefore, a housing quality inventory adapted from the APHA Appraisal Method; a morbidity survey in which we enumerated on a large fold-out form conditions currently affecting the family as well as certain items of the medical history; and an adjustment inventory which explored such issues as relations within the family, relations with neighbors, morale, and other matters relating to personal psychological state.

Initial Comparability

Background Characteristics—Table 1, in greatly abbreviated form, shows how the test and control groups compared initially with respect to a number of demographic and other background variables. In general, the two groups show very close correspondence on such matters as age, usual activity, size of family, income, public welfare assistance, marital status, veteran status, education of male and female heads of household, and original date of housing application.

Initial Housing Quality—Because of the basic hypothesis of the study, it is also important to know whether the two groups were initially comparable in matters related to the quality of housing before the test group moved to better housing. Table 2 summarizes selected items from our housing quality inventory. The general correspondence of the two groups is, again, quite close on such items as water supply, the location and sharing of toilet and bath, heating, plumbing, and rodent infestation.

Initial Morbidity—During the initial (before) interview, we obtained data regarding items of the medical history prior to the first visit. On such items (not shown in the tables) as reports of prior surgery, hospitalization for tuberculosis, the use of preventive medical facilities in the six months prior to the interview, and for five communicable diseases of childhood, the two groups are closely comparable.

During the initial interview and again in the first "after" interview—that is, wave 1 and wave 2, respectively—we also gathered information about chronic conditions present among persons in our sample during the two years preceding wave 2. Table 3 shows similar rates for

Table 1—Selected Demographic and Other Background Characteristics: Initial Comparability of Test and Control Families

		Test	Control*
	a. Person Data: N =	(1,828)	(2,977)
		Per cent	
(1) Age of persons	Under 5	30.9	30.5
	5–19	34.5	35.8
	20 and over	34.6	33.7
(2) Usual activity of all persons	Works full or part time	17.5	19.5
	Keeps house	15.8	14.0
	School	31.9	31.3
	All other (preschool, etc.)	34.8	35.2
	b. Family Data: N =	(396)	(633)
(3) Size of family	2–4 persons	48.9	49.1
(4) Income	Under $2,000	38.1	38.6
	$2,000–$2,499	25.5	21.1
	$2,500 and over	36.4	40.3
(5) Receiving welfare	Yes	22.0	23.0
(6) Marital status (female)	Married now	62.3	61.7
(7) Veteran status	Veteran family	28.7	31.1
(8) Education at most 9th grade	Wife	57.8	62.6
	Husband (per cent where present)	55.1	55.2
(9) Original application date	1952, or earlier	36.9	32.2

* Control per cents and rates in all tables were adjusted because of the two control families per test family in about half of our matched "pairings." In effect, these double-control families were each given a weight of 0.5.

the test and control groups not only for total chronic conditions, but also for most specific diagnostic categories, of which selected items are shown.

Table 4 shows episodes of illness during the two months preceding the initial interview and includes total conditions (all diagnoses) and two individual diagnostic categories. Comparison of the first two columns of this table reveals that for total conditions the rate for the control families is considerably higher than the rate for the test families. However, the difference is explained by the fact that the season of the initial interview varied considerably between the two groups of families.

When the seasonal difference is taken into account by appropriate weighting,

Table 2—Selected Housing Quality Characteristics: Initial Comparability of Test and Control Families

Housing Quality	Test	Control*
	Per cent	
Hot and cold running water in apartment	72.2	75.6
Bathtub in the apartment	71.2	71.2
Share bathtub with nonfamily persons	41.9	37.0
Toilet in the apartment	80.8	82.5
Share toilet with nonfamily persons	48.0	43.1
Central heating	53.3	50.4
Leaks in pipes or plumbing	25.3	21.0
Rats in the apartment	27.0	21.3
Number of families	(396)	(633)

* Control per cents weighted.

Table 3—Chronic Conditions Present During the Two Years Preceding Wave 2 as a Rate per 1,000 Persons Surveyed: Initial Comparability of Test and Control Families

Chronic Condition:	Test	Control *
Number of Persons Surveyed	(1,828)	(2,977)
Total Chronic Conditions	517.5	537.0
Tuberculosis	8.2	5.7
Venereal disease	4.4	5.5
Asthma	17.0	18.8
Diabetes mellitus	5.5	3.7
Diseases of nervous system	23.0	17.5
Diseases of the blood and sense organs	48.7	50.4
Diseases of the circulatory system	96.8	108.6
Bronchitis	19.1	22.5
Hernia	21.9	17.0
Diseases of skin and cellular tissue	27.4	27.7
Diseases of bones and organs of movement	41.6	35.3
Impairments	170.7	193.5

* Control rates weighted.

the difference between test and control groups effectively disappears. This is shown by comparing the test group rates in Table 4 with the adjusted (for season) rates of the control group.

Other Initial Data—The final kind of data which throw light on the comparability of test and control groups is derived from initial measures of personal and family adjustment. A preliminary look at the adjustment data reveals that for the vast majority of items, the same similarity exists between the two groups as has already been described in connection with background information and initial housing quality.

Summary of Initial Comparability—Our present impression is that extensive efforts have produced two apparently well matched groups of families. It is possible that this evaluation may change when we have constructed indexes of initial comparability, comprising a number of items taken together. In that event we will have to take initial characteristics into account when comparing rates of diseases between our groups in the after-period. In the meantime, we will proceed to examine the "after" morbidity information without serious concern about initial uncomparability.

Preliminary "After" Findings

The "after" period of the study began in the spring of 1956. By that time, the test families had been living in the new housing development for about nine months on the average, the range being from approximately two months to a year. Since that time, all families in both groups have been interviewed once every ten weeks. At each wave of interviewing we conduct a morbidity interview, and, in addition, varying by

Table 4—Episodes of Total and Selected Illness During the Two Months Preceding Wave 1 as a Rate per 1,000 Persons Surveyed: Initial Comparability of Test and Control Families

Diagnosis	Test	Control *	Control * (Adjusted for Season)
Number of Persons Surveyed	(1,828)	(2,977)	(2,977)
All diagnoses	1,040.5	1,165.6	1,060.5
Diseases of the respiratory system	281.2	388.9	299.5
Diseases of the digestive system	145.0	141.5	130.5

* Control rates weighted.

wave, a diet survey, or an interview dealing with matters of adjustment.

The morbidity interview is conducted by lay interviewers trained by the study staff. The interviews are conducted with the female heads of households, who report for each family member in turn on episodes of illness, aftermaths of disability, and medical attention received. One feature of our every-wave morbidity survey form is the use of a small check-list of six relatively minor conditions including colds, digestive disturbances, and home accidents. A second feature is an inquiry about specific chronic conditions that have been enumerated in preceding waves. The questioning covers the "past two months," that is, the two months prior to the date of the interview. In classifying the conditions responsible for episodes of illness, we use as a guide the sixth edition of the "Manual of the International Statistical Classification of Diseases, Injuries and Causes of Death," with a few adaptations and recombinations made necessary by the nature of the primary information.

The preliminary data are presented wave by wave for the first five afterwaves of morbidity interviewing. The period corresponds to the first 18 months of rehoused experience for the test families. Topics covered are episodes of illness by age (an episode being a condition "bothering" a person one or more times during the two months preceding the survey), persons experiencing one or more days of disability, and persons medically attended.

Part (a) of Table 5 shows the rates of episodes of illness of all degrees of severity. Rates of episodes among test families are higher than those among control families during waves 2 and 3. During the next three waves, the situation is reversed, control families having the higher rates. However, each difference is within the acceptable range of sampling error.

Examination of the specific diagnostic categories (not shown in the table) also reveals generally small test-control differences wave by wave. The absolute levels of the rates reveal that respiratory and digestive conditions make up approximately half the episodes occurring in each wave.

Examination of the same data by age in Table 5 reveals the familiar U-shaped distribution, highest rates in each wave occurring in the younger and older ages. For the age category 35 and over, test rates are consistently (but not significantly) higher than control rates. However, in the age ranges 5–9 and 10–19, a tendency appears, beginning with wave 4, for test rates to be lower than control rates.

Part (b) of Table 5 shows the per cent of persons in both samples who have experienced one or more days of disability in the periods covered. Disability includes the categories "in bed" and "kept from usual activities." For these data the test-control differences are small, the wave-by-wave pattern resembling that of episodes of illness in part (a) of the table.

Part (c) of Table 5 gives the per cent of persons medically attended in each wave. In all but wave 4, the test group has a small excess of medically attended persons over the control group. Analysis by age (not shown) reveals that the age groups from 10 to 19, and 35 and over play a role in this "reversal" of expectancy; the situation among the latter group corresponding to the analogous finding regarding rates of episodes of illness among older persons.

Our general impression is that for the 18-month rehoused period under examination the move to good housing has not on the average resulted in measurable improvement in rates of episodes and related matters for the test group as a whole over the control group. It may be that as the study progresses, further basic analysis will confirm this tentative judg-

Table 5—Morbidity During the Two Months Preceding the Survey, by Wave

		Wave				
		2	3	4	5	6
Date Wave Began:		4/9/56	6/18/56	8/27/56	11/5/56	1/14/57
No. of Persons Surveyed:	Test	(1,888)	(1,893)	(1,915)	(1,883)	(1,891)
	Control	(3,018)	(3,014)	(2,961)	(2,922)	(2,893)
(a) Episodes of Illness* as a Rate† per 1,000 Persons Surveyed, by Age						
All ages	Test	1,341.7	1,114.6	891.4	970.2	910.6
	Control	1,321.9	1,018.9	960.1	993.1	959.6
Under 5	Test	1,194.5	1,023.5	723.1	862.1	860.6
	Control	1,125.3	952.1	821.4	884.2	868.2
5–9	Test	1,057.4	848.9	547.5	672.6	621.6
	Control	1,061.7	723.0	5[illegible]4.0	787.2	760.9
10–19	Test	1,059.8	752.1	[illegible]	762.8	668.2
	Control	1,030.4	689.9	7[illegible].9	800.8	820.5
20–34	Test	1,634.4	1,396.5	1,254.9	1,138.5	1,105.5
	Control	1,709.7	1,314.5	1,374.6	1,200.0	1,116.2
35 and over	Test	2,156.6	1,836.4	1,701.9	1,956.0	1,630.6
	Control	2,008.0	1,633.7	1,607.8	1,620.7	1,551.4
(b) Persons Experiencing One or More Days of Disability, as a Per cent† of Persons Surveyed						
	Test	29.6	23.7	17.7	20.7	21.4
	Control	28.1	20.3	20.2	21.8	23.0
(c) Persons Medically Attended, as a Per cent† of Persons Surveyed						
	Test	21.9	19.7	15.7	18.4	17.2
	Control	20.7	16.1	17.9	17.2	15.7

* Includes symptoms.
† Control rates and per cents weighted.

ment. In that case, the first possibility that comes to mind is that if housing quality has measurable effects at all and if our instruments are sensitive enough, it may take longer than 18 months for the effects to emerge. Another possibility is that housing quality already has had effects in the expected direction, but that a number of factors obscure these effects. Let us consider several modes of analysis being pursued at present to explore each of these possible obscuring factors.

Additional Analyses Planned

The first factor has to do with special aspects of the particular housing development in which the rehoused families live. As regards facilities traditionally considered important—such as water, heat, kitchen and toilet—the rehoused families have in general fewer deficiencies than the control families. However, several aspects of the housing development may operate in a contrary direction for particular health matters such as the communicability of certain diseases. For example, a majority of the test families live in 11-story, 110-family buildings served by two elevators. Because of these so-called high-rise buildings, the density of persons per square foot of ground area is much higher for these residents than for the controls and their neighbors. A possible consequence

is heightened opportunity for aerial transmission of certain diseases. One kind of analysis is to examine the episode rates of families living in high-rise buildings versus those living in low-rise, two-story buildings, for certain conditions such as upper respiratory and childhood communicable diseases. The low-rise buildings more nearly approximate the average slum block in density.

A second factor possibly obscuring housing quality effects has to do with the temporary and permanent losses incurred during each wave. The general loss picture is satisfactorily low, due to the extraordinary efforts exerted by the field staff in this direction. Through wave 6, permanent losses average less than 1 per cent of (the original sample) each wave. However, the question arises concerning the extent of bias in these losses. If families lost among the controls, for example, are composed of persons more prone to sickness, and those among the test group less prone to sickness, this would tend to obscure the effects of housing quality.

A possibly more serious source of similar bias occurs because of moves among the control families. It should be noted that we are continuing to follow up in ordinary fashion every family that moves, obtaining, in addition, complete housing information for each new place of residence. While only 6 per cent of the test families have moved from the housing development through wave 6, the more astonishing fact is that some 52 per cent of the control families have moved from their wave 1 place of residence. One-fifth of these have moved to some project under the Housing Authority's management and thus to dwelling units of clearly good quality. Furthermore, tabulations of the "new" and "old" housing quality of the controls who moved about in the city also show sizable improvement in housing quality among these movers as well. The consequence is, first, that the independent variable difference is possibly being narrowed markedly due to "natural" causes, and second, there arises the strong possibility of bias in the personal characteristics of the movers themselves and in their morbidity experience.

We are at present analyzing both "loss" and "move" data to establish possible bias, and if bias has arisen, the possible lessening of observable effects of housing quality that may have occurred.

Finally, there is another mode of analysis now under way which will throw light on the likelihood that certain subgroups among the test families have already profited substantially from the rehoused experience to date even though others may not. The initial housing quality of the test and control families was of generally poor quality, but not homogeneously so. Some dwelling units and structures had many deficiencies and some only few, although whatever the quality of test family residence, we tried to match similarly for the paired control. It seems reasonable to believe that the test families at the lower end of the housing quality scale were the ones most likely to profit from the move to good housing. A thorough test of this supposition awaits construction of indexes of housing quality in which we combine, largely according to the APHA Appraisal Method weighting scheme, many elements of housing quality.

The Home Interview as a Method of Collecting Data

Finally, we wish to touch upon the procedures being followed in collecting data, that is, the personal interview conducted in the home by a nonmedical interviewer. If the method is excessively crude or open to uncontrolled bias, then even if the true change in morbidity due to housing quality alteration were great during the period covered by waves 1 through 6, the change might go unde-

tected. The question of method is especially salient in the light of recent findings that cast doubt on the sensitivity of the home interview when compared to the outcomes of clinical examinations, the main import being that there is apparently serious under-reporting of chronic conditions in the home interview.[3, 4] However, the possibility that under-reporting occurs at all, or to the same degree in connection with acute conditions, still needs confirmation.

The issue of insensitivity was considered at the outset of the present study, while arriving at a decision as to the method of data collection. Some desired data, we became convinced, could not very well be obtained other than by some sort of interview: for example, occurrence of minor acute conditions, and an account of exacerbations of chronic conditions. Our attention to minor episodes was, of course, due to the reasonable a priori opinion that in a three-year period of rehoused experience, it was unlikely that test-control differences would lie mainly among major and serious complaints. We could not reasonably expect, for example, that there would emerge in our sample a significant test-control difference in new cases of tuberculosis. Our conclusion was to use a bigger, and perhaps coarser net.

It was necessary to consider measures which would give assurance that, even though the net is coarse for the test families, it must not be coarser for the control families. To achieve this end, we introduced a number of quality-control measures that help to minimize bias possibly arising from our method of data collection. These quality-control devices are as follows:

1. The senior staff of the study is in direct charge of field work, and is responsible for all the hiring, training, and supervision of the interviewers.

2. More than ordinary attention is paid to the training and preparation of interviewers. Two weeks of intensive training with our morbidity instruments, including observed interviews in nonsample homes, precede independent interviewing, regardless of prior nonstudy interviewing experience. There is refresher training for all interviewers three days prior to the beginning of each wave. Each interviewer is observed in the field in actual interviews at least once a week throughout a wave, the proper ratio of control to test observations being maintained. The results of these observations are made known to interviewers the day of the observation, and in more general terms, during regular, weekly interviewer staff meetings.

3. After the regular interview wave, one quarter of the families are reinterviewed with an abbreviated questionnaire, to enable us to check on the performance of interviewers when they are not under direct staff observation.

4. Twice during each wave, hand tabulations are made of the number of illness conditions enumerated by each interviewer. The purpose of these "interviewer variability" tabulations and of the reinterviews mentioned above is the detection of deviant interviewers with a view to making over-all interviewing procedures more uniform.

5. To prevent interviewer variability from introducing bias in either group, assignment of interviews is done in such a way that during a wave, each interviewer conducts both test and control interviews, the proper ratio of test to control being maintained for each interviewer.

Summary

We have presented preliminary morbidity data from the Johns Hopkins study of the effects of housing quality on physical and mental health. The study design includes initial measurement of two groups of families, one of which moved from dwellings in slum areas to a newly constructed public housing development, the other group remaining in the slum at least at the outset of the study.

Control families were selected and matched as well as possible with test families, once the latter were designated. Data have been presented regarding a number of background characteristics such as age, usual activity, size of family, income, education; regarding initial housing quality such as water supply, kitchen and bath facilities; and regard-

ing initial morbidity. The impression from the item-by-item comparison of the two groups is that they are well matched on many variables suspected of being related to the dependent variables of the study. We have also presented test-control morbidity data for less than half of the "after" period of the study, corresponding to the first 18 months of rehoused experience of the test families. These findings in general reveal no gross test-control differences attributable to the difference in housing quality through this period.

Several factors have been discussed that may tend to obscure test-control differences, and plans are now under way to explore these factors. A final section is devoted to measures for quality control which tend to insure lack of bias in the method we are using to collect the morbidity information.

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Report of St. Louis Study Available

"Public Health and Hospitals in the St. Louis Area: A Mid-Century Appraisal" is the study of the St. Louis Health Services completed in 1957 by the American Public Health Association with the help of an impressive battery of consultants in each of nine major health areas. This 438-page volume has been described as potentially having "a positive effect on the development of planned community health services throughout the nation" (A.J.P.H. Aug., 1958, p. 1068). As such it has value for many others besides the St. Louis community. Thus it is being made available generally for purchase. Social Planning Council, 417 North 10th St., St. Louis 1, Mo.; $3.75 including postage and handling charges.

Piecemeal development of water resources has revealed numerous inadequacies. On the other hand, an integrated program for development and use appears to be the answer. This article tells why this approach is necessary if our water problem is to be minimized, and how an integrated program can be brought into being.

INTEGRATED WATER RESOURCES USE AND DEVELOPMENT

C. J. Velz, C.E., M.S.P.H., F.A.P.H.A.

THE NUMBER ONE resource problem in the country today is water. Interest in water resources is not for the sake of water but for the sake of people, who must use it. The economic and social structure of whole regions depend upon available water resources and how these are used and developed. The free world is in a technological race, and estimates point to a doubling of industrial production in fifteen to twenty-five years. Paralleling industrial expansion is an unprecedented population growth with an accelerated trend from rural to urban living, spilling over political boundary lines into complex, industrial-urban corridors. If the free world is to meet these demands and is to keep pace with intensified technological urban growth, increased attention will have to be given to water resources development and use. Already in many areas acute water problems and rivalries break into the headlines of the newspapers. It is increasingly apparent to the public that all is not well, and questions are being raised concerning the competency of existing agencies to deal effectively with the situation. Unless some present wasteful practices are changed and a new and broader view is taken with respect to water resources development, communities and their industries are going to find themselves tightly boxed in with regard to possibilities for expansion and growth.

More is involved than a community water supply and a community sewage disposal system. Seldom is a city alone on a river; someone else is either above it or below it, and what you, they, or some governmental agency may do with water resources has an impact upon other water users. As the industrial-urban complex grows, competition for limited water resources intensifies and the multiple water uses—community and industrial supply, hydro, steam, and atomic power, flood control, navigation, irrigation, recreation, fishing, and the inevitable necessity of sewage and waste disposal—become more and more inextricably interrelated, calling for an integrated approach.

In this brief presentation, I wish at least to provoke a critical view of the water problem and a consideration of some new approaches which appear to hold good prospects of meeting the pressing water needs of the future.

Before looking forward, an objective review of past practices is in order, and then I shall turn to a river basin case history, the grass-roots approach developing in the Kalamazoo River Valley of Michigan.

There has been a growing tendency toward centralization of water resources development in federal agencies, principally in the Department of Agriculture, the Bureau of Reclamation, and the Corps of Engineers, with less and less initiative by state and local governments. The federal trend has been toward large-scale projects, to the neglect of many smaller drainage basins. Emphasis has been upon four principal aspects: flood control, navigation, hydro power, and irrigation, with little thought to other water uses. Almost no consideration has been given to providing an assured stream flow for community-industry's expanding needs or to the key problem of satisfactory sewage and waste disposal. With a few outstanding exceptions, state and local interests have not actively participated in shaping federal water policy, nor have they organized and taken initiative in developing a water policy of their own.

As a result, development of water resources has been largely on a piecemeal basis—each water use considered pretty much as an isolated problem independent of all other uses in the basin. In many instances a disaster, such as a dramatic flood, has dictated a one-sided view: development has been centered on flood control, with inadequate consideration of the over-all water needs, and at times actually to the detriment of other water uses. In other instances, special interests, public or private, dominate, and a single-minded development, such as large-scale navigation works, proceeds on a narrow basis, often with serious loss of natural self-purification capacity. Or hydro power is oriented to the serving of peak power demands, inducing radical fluctuations in stream discharge, with little or no flow permitted to pass downstream on off-peak periods. Frequently such operating practice involves a two- to three-day shutdown on week ends. Cutting off the river for two or more days each week is not very helpful to downstream users. The utility industry appears to be unaware that, paradoxically, on the one hand, it is spending substantial sums on promotion to attract new industry and encourage community growth in service areas, but, on the other hand, is making it virtually impossible, in the operation of hydro and steam plants, for industry to locate in the river valley. Such piecemeal, one-sided development results in waste of precious water resources and inevitably leads to chaotic water policy.

Public health agencies assigned major powers and responsibilities to deal with community and industrial water supply and waste disposal have, possibly unwittingly, fostered further fractionalization and piecemeal development. The two interrelated phases of the water contact cycle have been split as though they were independent; incoming water supply is dealt with largely as a problem separate from that of the outgoing waste water return. Incoming supply has received the major attention, but often the responsibility to consider adequately at the same time the satisfactory disposal of the spent water supply—the waste water returned to the stream—has received scant or at best belated attention.

In turn, each of these two phases has been further fractionalized. In many instances community water supply has been planned and developed on a narrow basis, leaving industries and rapidly expanding fringes outside the central political unit to fend for themselves. Hodge-podge water supply systems result, to the detriment of community and industrial growth. The water supply of Metropolitan Philadelphia comprises some 100 separate systems serving 163 political

units, with hundreds of independent industrial supplies. Similarly, the Buffalo-Niagara Falls urban-industrial corridor comprises some 50 separate systems, and the Greater Detroit Metropolitan Region involves some 33 separate systems with many independent industrial supplies. True, there are examples of integrated supply systems such as Boston and on the West Coast, but these are the exception rather than the rule.

Similarly, disposal of the spent water supply has been fractionalized. In many instances industrial waste has been considered as a problem separate from that of community sewage disposal. In fact, some agencies and cities have gone so far as to discourage or deliberately forbid admission of industrial wastes to the municipal system. Perhaps this approach reflects an archaic concept that the only problem in pollution control is to protect the community against communicable disease; hence, if only the sewage has been treated, all's well and the health department's responsibility has been met. Responsibility goes far beyond this in an industrial-urban age. To encompass the entire waste disposal problem assuredly means protection against disease, but more than that, it means insuring quantity as well as quality of water—not just drinking water, but water in all its uses conducive to optimum living.

Regulatory agencies with but few exceptions have been depending almost exclusively upon sewage and waste treatment as the cure-all for pollution prevention and abatement. It is increasingly apparent that recovery and treatment of wastes afford only a partial answer. There is no such thing as 100 per cent treatment or recovery; technical and economic limitations inevitably result in a situation where some fraction of the waste must ultimately be handled by natural purification in the water course. Thus it is axiomatic that in an urban-industrial society, some end products must be handled by the water course.

As a gift of nature, each water course has its unique natural purification capacity, which constitutes an invaluable water resource asset. This asset should and must be utilized. Relatively, the quantity of water required for incoming water supply is much smaller than the magnitude of stream flow required for satisfactory disposal of sewage and waste effluents. The key to satisfactory waste disposal, therefore, is a quantitative determination of the waste assimilation capacity of the stream along its course under reasonable probabilities of the low stream flow expected. It is fair to say that major effort has not been devoted to this quantitative evaluation. Rather, treatment requirements and design of works have been somewhat arbitrarily arrived at. The result usually is either too little or too much treatment. Without a rational basis for design, there has been an alarming tendency to add many costly features to works which do not remove waste load and are ineffective in protecting the stream. Society cannot afford the luxury of expensive monuments along the banks of rivers unrelated to the real capacities of the stream or to the water use requirements placed upon it.

There is an increasing number of situations where the "treatment alone" philosophy has reached the end of the road. While the city of Dayton now has so-called complete treatment, in the Miami Basin urban-industrial corridor, the residual effluent load, in combination with adverse effects of other uses of the river, results in serious dissolved-oxygen depletion approaching exhaustion during the dry weather and drought periods. In the headwaters, treatment of community and industrial waste by trickling filters, followed by activated sludge, is inadequate to protect against dissolved-oxygen exhaustion of the receiving stream during the drought

season. Treatment will always play an important role in satisfactory waste disposal but clearly it has limitations, and other approaches are essential if industrial and urban growth is to continue.

It also can be fairly said again that with a few outstanding exceptions, there is a conspicuous vacuum in leadership and initiative at the state and local levels in representing the water needs of the community and of industry when plans for other water resource developments are under consideration, particularly the proposals of federal agencies and large utilities. Depending upon how they are planned and operated, man-made river developments can be either detrimental or beneficial to community-industry water uses, especially as they concern the difficult problem of waste disposal. Each river developer, whether for power, navigation, irrigation, flood control, or some other use, acts as though in a hermetrically sealed cell without too much thought of the impact of his project upon other water users. Whose responsibility is it to be on the alert to see that adverse effects of a project are eliminated or minimized and that, where feasible, beneficial multipurpose features are included?

On one large coastal river, a federal agency is proposing to divert the entire fresh water flow around a busy harbor for the avowed purpose of saving dredging expense. If constructed, the diversion would be disastrous from the standpoint of community and industrial waste disposal. On a large southern river, a federal flood control and hydro development project is being constructed which, if a small regulating reservoir were included, could eliminate diurnal and week-end fluctuations in discharge induced by hydro operation and could make available from the large upland storage an assured dry weather flow three times that attainable under the present plan. These examples illustrate the need to evaluate the impact of one use upon another and the need to take action at the planning stage—once constructed, it is too late.

Further critical evaluation of past practices only emphasizes the folly of a piecemeal approach to water resources use and development. As we face the increasing demands for water from future urban-industrial growth, hope lies in a broader view, and perhaps with better understanding of the interrelation among uses the benefits of an integrated approach will be realizable. There are encouraging signs of change, evidenced by responsible local leadership and pooling of special interests, toward planning more orderly water resources development on an integrated basis.

One of the most promising means of alleviating many acute water problems and of providing an increment for future expansion is drought control through low flow regulation. An exasperating aspect of water as a natural resource is its dynamic character. There is no assurance of a fixed definite quantity, as in the case of a static mineral resource. Water is a variable, and in making use of it in the natural setting, one is always at the mercy of chance occurrence. In addition to very unequal geographical distribution of stream flow, the quantity, tomorrow will be different from that of today, varying through the seasons and from year to year with extremes of flood and drought. While the average flow of a river may appear good, the real restriction limiting community and industrial growth is the uncontrolled natural drought flow. The threat of drought is a constant overshadowing factor but at times is unwisely not recognized or is ignored. Following the chance occurrence of a succession of wet years, the temptation is to expand community and industrial development beyond a reasonable risk, only to find during dry years, which are certain to occur, insufficient water to support that expansion. This is the nature of the variabil-

ity and insecurity of water resources in the natural setting.

There is an alternative to living within the restricting framework of natural drought variations, that is, drought control through low flow regulation. Excess water during flood season is stored for release during the dry, warm-weather season thereby assuring a dependable stream flow several times greater than that obtainable under conditions of uncontrolled drought yield. This minimizes the risk of water shortage, eases the burden of waste disposal, and permits a much higher level of community and industrial growth. Low flow regulation is not entirely a new concept; what is new is a grass-roots approach, with local community and industry initiative, in water resources development.

Let us now turn to the Kalamazoo River Basin, which typically reflects the shortcomings of past piecemeal development, the impact of one conflicting water use or development upon another, and exhibits a bright ray of hope for the future.

The Kalamazoo Basin, comprising some 2,000 square miles, is roughly 100 miles long by 20 miles wide, draining into Lake Michigan. The basin lies wholly within the State of Michigan and is in the path of the rapidly expanding Detroit-Chicago industrial-urban corridor. The major cities are Kalamazoo, the home of the world's largest paper de-inking concentration, and Battle Creek, the home of the great Kellogg and Post breakfast food industry.

Early river development centered on navigation, followed by a series of 15 small run-of-the-river hydro power plants, later augmented by six steam power stations. As early as 1930, community and industrial growth created stream pollution problems, particularly during the dry weather season. By 1945 the situation was acute, aggravated by the fact that pools behind dams were slowing the time of passage and accumulating deposits; steam power plants were increasing the river temperature and hydro power was inducing radical fluctuations in stream flow. Under the leadership of the State Water Resources Commission, municipalities and industries had taken a first step toward pollution alleviation through process changes and treatment works at a cost to date of upward of 7.5 million dollars. In the past ten years, however, expansion and increased production have continued apace, and today, notwithstanding all efforts, the river is in critical condition. Treatment alone is not the answer—not even so-called "complete" treatment will meet stream requirements, so that the outlook for future growth in the valley is indeed dismal under conditions of uncontrolled drought stream flow. And then, to further illustrate the folly of a piecemeal approach, a federal agency, stimulated by the 1947 spring flood, proposed local flood protection works which, if constructed, would virtually negate the efforts expended for the alleviation of pollution.

In the sense of living within the framework of the expected natural drought pattern, the Kalamazoo Valley has already overexpanded. The only hope for the valley is more water down the river, which is feasible only by drought control through low flow regulation. Intelligent leadership in the valley recognizes this and is ready to abandon the piecemeal approach for a more rational integrated development. Recently, work began quietly in this direction. In the past, with Michigan's flat topography, reservoir sites had been assumed to be nonexistent. However, it was decided to take a new look, and a systematic search was rewarded by a rather dramatic possibility for a multiple-purpose development in the headwaters.

Preliminary study indicates the feasibility of a reservoir of about 18 square miles which will assure a stream flow three times the drought yield in the

lower river to six times in the upper reaches. The site is directly in line with migratory duck flight and is ideal for duck nesting. After mid-May or the first of June, when fledglings are on their own, the water is available for augmenting the summer-fall low stream flow. Recreational possibilities may also be realized by stabilizing several smaller lakes or, easily, through segregation of a portion of the reservoir for sport fishing, bathing, boating, and resort development. Flood hazard in the valley is not a matter of loss of human life, and it appears that some alleviation can also be provided from the available reservoir storage. With the reservoir located in the headwaters, low flow regulation benefits all users along the entire river course—the hydro power, the steam power, the ground and surface water supplies, recreation—and, of course, it provides a substantial increment to the stream's waste assimilation capacity.

Perhaps the most important aspect of the integrated approach to water resources development is the opportunity it affords for future growth in the valley. Removing the restricting pinch of uncontrolled drought and increasing dry-weather stream flow several fold profoundly changes the social and economic outlook, not only in the areas of existing community-industry concentration, but because entirely new reaches of the river would be opened for industrial sites and other developments.

With the encouragement of the State Water Resources Commission and the State Conservation Department, the plan has been presented to several groups of civic and industrial leaders of the valley, where it has been enthusiastically received. There is no precedent for this type of grass-roots approach toward integrated water resources development. Much work remains to bring the plan to practical realization. In addition to technical, legal, and economic aspects, public education and public relations necessary to successful local initiative are recognized as essential to fruition of the plan.

Thus far, certain basic premises seem to prevail. These are: (1) an intelligent appreciation of the importance of water to the economic and social life of the valley, with recognition of long-range as well as immediate problems; (2) a strong desire for and pride in local initiative; (3) a willingness of special groups with vital stakes involved to pool their special interests in an integrated approach; and (4) a willingness to share the cost locally.

The Kalamazoo Valley is a promising pilot development to watch. It may prove to be the pioneer in a new national pattern of integrated water resources development with a resurgence of local action.

The challenge to consider the water problem as a whole on an integrated basis is squarely before the public health profession. Traditionally, society has delegated major responsibilities for water in very broad terms to the health agencies. Let us hope that by vision and action this public trust will justifiably be continued.

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This paper was presented before a Joint Session of the Conference of Municipal Public Health Engineers, the Conference of State Sanitary Engineers, and the Engineering and Sanitation and Mental Health Sections of the American Public Health Association at the Eighty-Fifth Annual Meeting in Cleveland, Ohio, November 14, 1957.

Despite the elimination of endemic yaws from Guam and other Pacific islands, positive serologic reactions are still frequently found in the population. These findings are discussed in relation to the theory that infection with yaws protects the individual against venereal syphilis.

THE CLINICAL INTERPRETATION OF SEROLOGICAL REACTIONS IN VENEREAL AND ENDEMIC TREPONEMATOSIS

Niels H. Poulsen, M.D.

NONVENEREAL TREPONEMATOSIS, or yaws, is endemic in most rural areas in the tropical belt. An estimated 50 million persons are suffering from this disease in active or latent form.[1]

In the U. S. Territory of Guam and in the other Pacific islands of the Trust Territory, yaws is known to have been highly prevalent before and during World War II.[2] Mass treatments with penicillin conducted by the U. S. Navy Medical Corps after the war [3] have eliminated the infectious state of this disease to a degree where active yaws is rarely seen on Guam or on any other of the small Mariana Islands.

Positive serological tests, however, are still frequently found among the indigenous Guamanian population and among the increasing number of immigrants from the Trust Territory.

Although endemic treponematosis (yaws) and venereal treponematosis (syphilis) are clinically differentiated diseases,[4, 5] no serological tests, including the Treponema Pallidum Agglutination (TPA) and Treponema Pallidum Immobilization (TPI) tests, have been able to demonstrate any significant diagnostic difference between the two.[6]

Experience has shown us that venereal syphilis is rarely found in areas with a high prevalence of endemic yaws,[7] but it is not known to what degree or how long an infection with yaws will protect a patient against syphilis.

Due to the large transient military population on Guam, venereal disease control, including control of syphilis, is a problem of major public health significance. This is demonstrated by an increasingly high incidence of gonorrhea in the military as well as in the civilian population. Serological tests are therefore required for all immigrants to the island and for several groups of the island population, such as food handlers, applicants for marriage, pregnant women, and persons drafted for military service or seeking employment with military, federal, and local governmental agencies. The right interpretation of a positive serological test is therefore a question of high importance for the person concerned.

While a positive serological test due to latent or inactive yaws generally may be considered a harmless, insignificant condition, this is not the case if syphilis is the underlying cause. A single injec-

tion of one of the penicillin compounds capable of maintaining a high blood level for several days for example, has proved to be adequate treatment for almost all cases of yaws,[8] whereas syphilis requires considerably more intensive and long-lasting treatment.[9]

As will be demonstrated in this study, serological tests often remain positive after healed yaws despite adequate and repeated treatment.

A false interpretation of a positive serological test may thus cause severe economic and social damage to a patient innocently accused of having acquired a serious venereal infection and, on the other hand, insufficient treatment of syphilis may lead to development of very serious late syphilitic manifestations. Until laboratory tests exact enough to differentiate between venereal and endemic treponematosis have been developed, clinical judgment remains the only guide for evaluation and/or treatment of such cases. The clinical experience presented in this study is therefore believed to be of more than just local interest.

Material

Since January 1, 1955, and until May 30, 1957, a total of 10,855 blood specimens has been serologically tested in the laboratory of the Government of Guam hospital, which also serves the Division of Public Health. Eight hundred and thirty-nine, or 7.7 per cent, of all blood specimens showed positive reactions in various degrees to Kahn, Mazzini, or VDRL tests. Until March, 1956, all three tests were used concurrently and a serological test was deemed positive only when showing reaction to at least two of the three tests. In the latter period of the study, the more sensitive VDRL test has been the only test used routinely. This explains the slightly higher percentage of positive tests found in 1956 and 1957, as demonstrated in the following tabulation:

Serological Tests

Period	No. of Tests	Positives No.	Positives Per cent
(Jan., 1955 to May, 1957)	10,855	839	7.7
Jan.–Dec., 1955	4,611	307	6.6
Jan.–Dec., 1956	4,633	399	8.4
Jan.–May, 1957	1,604	133	8.3

Since many persons were examined semiannually or annually, as required for food handler certificates and the like or because of new pregnancy or following treatment, the number of tested persons was considerably smaller than the number of blood specimens examined.

This study is based on the examination of 310 persons with positive serological findings referred to the Public Health Clinic during the aforementioned period for evaluation and/or treatment of their condition. Only cases with insufficient data are excluded.

With the exception of two white females from the U. S. mainland, the examined persons were all of oriental origin: native Guamanians or natives from the Trust Territory islands and a few Filipinos residing here. (Military personnel and their dependents and many civilians from the American mainland are under medical supervision of the Navy hospital and/or have recently had serological tests before their arrival here—thus, do not figure in this study.)

Age and Sex Distribution

The youngest patient seen was 10 years old, the oldest was 68 years. The age distribution is as follows:

10–20 years	86 patients
21–40 "	165 "
41–60 "	44 "
61–70 "	3 "
Age unknown	12 "
Total, both sexes	310 patients

The total number of male patients was 146, of females 164. The ratio of men

to women was 1:1.12. However, the sex distribution was incidental. While the percentage of males was higher among immigrants from the Trust Territory islands (mostly students), this was compensated for by the large number of pregnant females examined.

Examinations

Great stress is laid upon getting an exact case history. Many of the patients have only a limited knowledge of English, but a Guamanian nurse is always at hand to act as interpreter.

All patients are thoroughly questioned about slow-healing sores, especially in childhood, about symptoms of venereal diseases, former serological tests, and former treatment with penicillin, arsenic, or bismuth.

Many of the prenatal patients have histories of several normal deliveries of healthy children despite repeated positive reactions to serological tests. Such information indicates that a positive serological test is probably due to healed yaws rather than to latent syphilis.

The physical examination is aimed mainly at detecting scars from chancre or late syphilitic manifestations. Scars from healed yaws are usually found around the mouth "nursing-type" yaws or on the extremities, especially on the lower legs. Scars from nursing-type yaws are easily recognizable and are rarely due to diseases other than yaws, whereas scars on the extremities may be caused by many other conditions, such as accidents, operations, tropical ulcers, or infected dermatomycoses. Some signs are characteristic, however, for the scars usually seen after healed yaws. These scars are generally multiple, the skin covering them is thin, smooth, and often darkly pigmented. Usually the scar is about the size of a penny or somewhat larger; the shape may be discoid, annular, falciform, or polymorphous. Plantar and palmar lesions are rarely seen on Guam.

Although none of the mentioned conditions are pathognomonic for yaws, a history of slow-healing sores in childhood, successful treatment with penicillin, arsenic or bismuth, lack of evidence of venereal diseases, combined with the finding of typical scars, makes it highly probable that a positive serological finding is caused by yaws and not by a syphilitic infection.

Using these indications—or their absence—as a guide for evaluation of the significance of a positive serological test, the 310 cases examined may be divided into two groups:

Group I — Undetermined cases, in which further treatment and observation were deemed appropriate.

Group II—Cases of healed yaws for which no further treatment and observation were deemed necessary.

Group I comprised 103 patients, or one-third of the total number. The age and sex distribution was the same in both groups.

Active yaws was found in only two cases, both with long-lasting sores on the legs. In both cases Treponema, indistinguishable from Treponema pertenue, was demonstrated by dark field microscopy. Both cases responded promptly to treatment with procaine penicillin, 600,000 units daily for five days. Serological tests, however, remained positive in both cases after two months of observation.

In four patients, the case history or pathological findings were suggestive of syphilis as the cause of the positive serological test. Two of these were the only "stateside Americans" examined in this study. One had a history of syphilis in 1941, for which she had been treated with arsenic and bismuth. Her serological test was positive in 1955, when she applied for a food handler certificate, but became negative following treatment

with six million units of penicillin. The other white female had an exanthema on her back suggestive of psoriasis circinata or syphilis. Treponema pallidum was not demonstrated, but her skin affection subsided and her serological test became negative after penicillin treatment.

The other two patients were Guamanian males in their thirties, with no history of yaws or scars from yaws. Both presented pathological neurological findings—in the first case suggestive of incipient tabes, in the other case quite possibly attributable to amyotrophic lateral sclerosis, a disease highly prevalent on Guam.[10] Serological tests of spinal fluid were negative in both cases. Despite penicillin treatment of 600,000 units daily for 15 days, neither, the serological findings nor the neurological symptoms showed any change after three months.

The other 97 cases showed no pathological findings apart from the positive serological reactions, which were found, incidentally, following routine examinations. Treatment was given in these cases for the following reasons: no history of yaws; lack of suggestive scars; no former treatment; possible exposure to venereal disease; or any combination of these reasons. Only eight rechecks of serological tests were recorded in this group, after two to three months' observation and upon completion of treatment with at least three million units of penicillin. Of these, five remained positive and three became negative.

The routine treatment given was procaine penicillin, 600,000 units daily. In 67 cases this treatment was given for five days (three million units) and in 36 cases for 10 days or more (at least six million units). Patients with no signs of yaws and with any possibility of syphilis were treated with large doses of penicillin.

Group II, comprising patients who did not receive any further treatment because the positive serological findings were deemed insignificant and due to healed yaws, consisted of 207 patients, or two-thirds the total number of patients examined in this study. Ninety-seven of these patients had already been adequately treated before the time of examination recorded here. Twenty-seven patients had received at least one penicillin series of not less than three million units, and 70 patients had a history of repeated treatments, with not less than two penicillin series, 600,000 units daily for five days, or at least six million units of penicillin. Some patients (exact number not available) had also been treated with arsenic and/or bismuth.

These treatments had all been given from one to six years prior to the last serological test; probably many of the patients had also received further treatment after World War II, but no records were available to prove or disprove this opinion.

None of this group had any history or any symptoms—apart from the serological findings—suggestive of venereal disease. Most of them had a history of yaws or typical scars or both, but none of them had been suffering from active yaws for the preceding 10 years.

However, it is noted that 97 patients, or almost one-third of all cases in this study, showed positive serological reactions 10 years or more after the yaws infection had become inactive and despite massive and repeated penicillin treatment.

The remaining 110 patients in the second group had not received any treatment at all, or the amount of treatment was unknown.

Since all of this group had a history of yaws which had been inactive for at least 10 years (in some cases up to 60 years), had typical scars, no suggestion of venereal disease, and no other pathological finding except the positive serological test, it was deemed unnecessary to institute treatment in these cases and the serological findings were classi-

fied as "insignificant, due to healed yaws."

It is stressed that no case of late syphilitic symptoms or relapse of activity of yaws has been observed in patients whose positive serological tests were classified as "due to healed yaws."

Case Histories

A few case histories will illustrate the typical findings and the clinical evaluation in the different groups of patients.

1. F. A. R., 30 years old, Guamanian female. On examination in March, 1955, VDRL and Kahn tests were positive in a dilution of 1:16. In 1954, this patient had received five daily injections of procaine penicillin, 600,000 units each, because of positive serological findings. She denied any history of yaws. However, many typical scars were seen on her lower legs. Two large thin-scarred lesions were noted over the anterior surfaces of both tibiae, which on x-ray examination showed some irregular, cortical thickening, most marked on the right. There was no evidence of activity of yaws or of a syphilitic infection, and no further treatment was given. Recheck in December, 1956, showed serological findings unchanged; no signs of active yaws. Health certificate was issued without further treatment or observation.

2. K. Y., 24 years old, male from Rota island. In August 1956, Kahn, Mazzini, and VDRL tests were strongly positive. Patient believed "he probably had yaws in childhood," and a few suggestive scars were found on both legs. Case history revealed that the patient had received at least three series each of three million units of procaine penicillin and five injections of Mapharsen, 0.6 grams each, in 1954. There was no evidence of syphilitic infection. Since treatment with nine million units of penicillin and three grams of Mapharsen did not change his strongly positive seroreaction, no further treatment was attempted.

3. J. B. M., 65 years old, Guamanian male, who in March, 1956, applied for a food handler health certificate. VDRL test was positive in dilution 1:4. Patient could still remember that he had had yaws at the age of five, with spontaneous recovery. He had never since been sick nor had he received an injection of any kind. He had eight healthy children. Physical examination was negative apart from a few scars on both legs. Since there was no evidence of active treponematosis, health certificate was issued and no treatment ordered.

4. A 14-year-old boy from the Palau Islands. VDRL was positive upon examination for immigrant clearance to Guam in August, 1955. Around his mouth patient had typical nursing-type scars, which he stated were caused by yaws in infancy. He had never had any sores since and did not know about treatment. No other pathological findings were revealed by physical examination. No treatment was instituted and immigrant clearance was given upon the strong evidence of the clinical insignificance of his positive serological test.

Summary and Conclusion

Findings among the 310 patients reported in this study show that Kahn, VDRL, and Mazzini tests may remain positive indefinitely after spontaneously healed yaws and for several years after massive and repeated penicillin treatment.

The findings support the theory that infection with endemic yaws protects a patient against venereal syphilis, and it seems highly probable that this immunity may last several years after the yaws infection has healed spontaneously or following treatment.

Indications are given for the interpre-

tation of the clinical significance of positive serological reactions in a population where yaws are or have been endemic.

It is stressed that each case must be critically and thoroughly examined to avoid both unnecessary treatment and severe social and economic damage to a patient with persistent positive serological reaction due to healed yaws.

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A Veterinary Public Health First

What has been called the "first institute on Veterinary Public Health Practice" was held at the University of Michigan October 6–9. Sharing sponsorship with the school were the Association of State and Territorial Health Officers, the Association of State Public Health Veterinarians, the American Board of Veterinary Public Health, the American Veterinary Medical Association, the Conference of Public Health Veterinarians, the university's College of Veterinary Medicine, the Michigan Department of Health, the Public Health Service Communicable Disease Center, and the American Public Health Association.

L. R. Davenport, D.V.M., chief of the Bureau of Milk Control and Veterinary Public Health, Illinois Department of Public Health, represented the APHA on the planning committee for the institute, which worked for some two years in preparation. Berwyn F. Mattison, M.D., executive director of the APHA, chaired the opening session.

Leonard M. Schuman, M.D., associate professor of public health, University of Michigan School of Public Health, summarized the four-day institute in a paper that will be published in an early issue of the American Journal of Public Health. Also given at the final session was a paper on classification of positions by J. J. Donovan, associate director of the Public Personnel Association. This, too, will be used in the Journal in full or in abstract.

This paper evaluates direct colony counts and the dilution method as means of testing the coliform density of water samples. The authors indicate the need for further improvement in this area and believe that the membrane filter technic has the greatest potential.

EVALUATION OF THE RELIABILITY OF COLIFORM DENSITY TESTS

Joseph A. McCarthy; Harold A. Thomas, Jr., Ph.D.; and John E. Delaney

THERE ARE TWO general methods at the disposal of a sanitary bacteriologist for estimating the coliform density of a water sample, one that yields a probable count and one that yields a direct colony count. The dilution or multitube method resulted logically from the definition of "coliforms" as organisms fermenting lactose with the production of gas under certain environmental conditions. The first attempt at coliform density quantification consisted of inoculating serial dilutions of a sample into lactose broth, and an "indicated number" of coliforms was calculated from the reciprocals of the dilutions in which positive results appeared. The practice of using replicate tubes from decimal dilutions of a sample was suggested by McCrady in 1915,[1] when he coined the expression "most probable number" (MPN) and later was fostered by Greenwood and Yule (1917)[2] and Hoskins (1934).[3] This expansion of the dilution method gave a "most probable" estimate of the coliform concentration present in a sample, based on probability formulas and the occurrence of positive and negative tubes in replicate decimal dilutions. The technic was finally adopted as compulsory in the eighth edition of "Standard Methods of Water Analysis" (1936).[4] The direct colony count method depends on the biochemical ability of coliform organisms to produce a "characteristic" visible reaction with the various media that have been formulated. This method is used in the agar plate, membrane filter, and Bacto-Strip technics.

It is the purpose of this paper to compare the colony count procedure and the dilution procedure as to their theoretical soundness and practical application. This analysis will discuss the strong and weak points of each technic and thus indicate their present position and future potentiality in the field of sanitary bacteriology.

Theoretical Evaluation

The 10th edition of "Standard Methods," [5] in beginning the discussion on the estimation of coliform group density, states, "It is desirable to keep in mind the fact that, unless a large number of portions of sample are examined, the precision of the fermentation tube test is rather low." This statement is the result of the studies by Allen (1932),[6] Halvorson and Ziegler (1933),[7] Gordon and ZoBell, (1938)[8] Dalla Valle (1941),[9] and others on the experimental error associated with the multitube fermentation method. Allen pointed out that, if the relative probable error is to be reduced to about 5 per cent, at least

1,000 tubes must be used for each dilution. Halvorson and Ziegler found from their analysis of the MPN expression that with 40 tubes in each dilution for a confidence limit of 95 per cent, the count may vary between 47 per cent above and 38 per cent below the true count, and that with only five tubes for each dilution, the MPN estimate will fluctuate between 260 per cent above and 70 per cent below the true count.

It can be shown that the reproducibility or precision of the 5–5–5 tube MPN test is theoretically inferior to that of colony count procedures, assuming that all the coliform species grow equally well under the environmental conditions presented by both procedures. The standard error of a plate count according to statistical theory is given by the product of the Lexis ratio and the square root of the count. With careful processing of the samples it is usually possible to get a degree of reproducibility between replicate plates corresponding closely to that expected from a random (Poisson) distribution of bacteria, that is, with a Lexis ratio of unity. In accordance with this theory, in testing 10 plates using a sample in which the true density, for example, is 50 per ml, the expected range of counts is

$$\mu \pm 1.54\,\mu^{1/2} = 50 \pm 1.54\,(7.07) = 39 \text{ to } 61 \text{ per ml}$$

where the factor 1.54 is taken from a table of the distribution of the range in normal samples.[10]

The dispersion of replicate MPNs from multitube tests accords with an entirely different probability model. It has been shown by Cochran (1950) [11] that the logarithms of the MPNs of replicate tests have an approximately normal distribution. When five tubes are used in each three or more decimal dilutions the theoretical standard deviation of the logarithms (base 10) of the MPN is 0.246. Thus when replicate 5–5–5 MPNs are plotted on log-normal probability paper, an approximately straight line should be obtained having a geometric standard deviation of $10^{0.246} = 1.77$. In testing a sample containing 50 coliforms per ml the expected range in 10 replicate 5–5–5 tube MPNs would be

$$50(1.77)^{\pm 1.54} = 21 \text{ to } 120 \text{ per ml}$$

This range of expected values is considerably broader than the corresponding range for plate or direct count shown in the foregoing.

Thomas [12] has shown from a mathematical analysis of the MPN formulation that the MPN is inherently biased on the positive side. When n fermentation tubes are used in each of a series of decimal dilutions (e.g., 10, 1.0, 0.1 ml), the bias factor is $e^{0.805/n}$. Therefore, the common 5–5–5 tube MPN test yields results that on the average are 18 per cent on the high side of the "true" coliform population existing in the samples. The expected mean of the replicate 10 MPNs in the example above is 59 ($50e^{0.805/5}$), which indicates a skewed distribution about the true value. Thus, it is sound to say that the best estimate of the true density is obtained from the MPN by applying the bias correction as given by the formula $e^{-0.805/n}$; for example, if the MPN were 59 per ml, the corrected estimate would be $59e^{-0.161} = 50$ per ml. It is pertinent to note that the bias correction is not a constant factor but varies with the number of replicate tubes in each dilution.

Practical Evaluations

Theoretically the colony count procedure is advanced as unbiased and embodying greater precision and reproducibility than the dilution technic and hence the preferable method. Because of other limitations, however, no adaptation of the direct colony count procedure has been perfected sufficiently to be accepted as a standard estimator of the coliform density. The colony count

technic, when employing selective agar, is plagued with a number of practical disadvantages that prevent its acceptance for coliform estimation. The amount of sample that can be examined is very small and therefore the coliform density of a sample often restricts this technic as a possible method of analysis. The biochemical reactions by which the coliform organisms are identified and counted are not exclusive for this group of organisms, and other organisms in the bacterial flora of a sample may be erroneously identified as coliforms, thus producing high results and an overestimate of the coliform density of a sample. Underestimation of the bacterial pollution is also possible using selective agar due to inhibition of growth and to the inability of all the strains of the coliform group to produce the characteristic reaction at the same time and temperature of incubation.

The new Bacto-Strip method of determining the coliform density of a sample appears to suffer from the same disadvantages inherent in the plate method of analysis, namely, the restriction of sample size and imperfect and uneven degrees of coliform recovery.

The direct count approach using the membrane filter technic has eliminated the sample volume disadvantage of the solid medium and Bacto-Strip technics. In the opinion of some bacteriologists, however, the difficulty with false-positive reactions and growth inhibition of certain members of the coliform group by the selective membrane filter media still remains a barrier against its acceptance as a coliform estimation technic with status equal to the MPN test. On the credit side of the ledger, the membrane filter procedure possesses two outstanding advantages over the MPN procedure besides those already attributed per se to a direct count method. The time required for a sanitary bacteriological analysis of a water sample is reduced from 48 or more hours to 20 $\pm$ hours, and the volume of sample analyzed may be greatly increased. Of all the colony count methods, the membrane filter technic appears to possess the greatest potential for estimating the sanitary quality of water.

In general, sanitary bacteriologists shun mathematical articles dealing with the formulation of the MPN test as based on probability theory. Perhaps laboratory people sometimes are not equipped to assimilate abstract treatments and as a result do not have an adequate appreciation of the low precision and the mathematical bias of the tube technic. The purpose of the section which follows is to present in a concrete manner through experimental studies:

A. The magnitude of the bias of the MPN test and its practical significance.
B. The dispersion of the MPNs of replicate tests about the "true" density.*
C. The reproducibility associated with the direct plate colony count procedure.
D. The reproducibility of pairs of MPN determinations on a natural water source.

Technical Approach

Since we were concerned with the estimation of coliform density by the MPN method, we chose to use suspensions of various species of the coliform group and to define as the "true" density the arithmetic mean of counts obtained on tryptose glucose agar. We believed that the use of natural waters would introduce complications from inhibiting substances and interference from noncoliforms. A natural water would have entailed the use of a selective solid medium, which our experience had shown might well yield results that could be uncertainly high or low.

The experiments were designed to eliminate extraneous sources of variance

* The "true" density of bacteria is conceived as the average density that would be obtained hypothetically from an infinite number of replicate tests made simultaneously on a given body of water, when a consistent (in the statistical sense[10]) estimator for the average is used.

so as to investigate the reproducibility and the bias of the MPN method under ideal conditions. In routine testing, sample errors larger than those reported herein will normally be obtained.

Laboratory Method

Fifteen suspensions of pure culture coliform organisms, covering a wide selection of the spectrum of the coliform group were prepared, and 10 tryptose glucose agar plates and 10 MPN determinations (5-tube, 3-decimal dilutions) were made from each suspension. The plates and sets of tubes were inoculated in random sequence to avoid the influence of any possible time effect and all were incubated together at 35°C. The plates were counted at least twice after 24 hours and the fermentation tubes were examined according to Standard Methods.

A. Magnitude of the Bias of the MPN Test

The summary of the data obtained from the 15 runs appears in Table 1. Column 1 presents the arithmetic mean of the 10 replicate plate counts comprising each run. Column 2 presents the arithmetic mean of the corresponding 10 MPN sets, and in Column 3 are shown the ratios between the MPN average and the plate count average. Similarly, in the following columns are shown the geometric mean, the median, the harmonic mean of the replicate MPN determinations, and the ratios of each with the corresponding plate count average. In Column 10 are presented the 50–50–50-tube most probable numbers by the approximation of Thomas,[13] and the next column gives the ratios. The simple density estimation formula[13] gives results that approximate the MPN and may be used for any fermentation tube scheme including those with dilution ratios other than tenfold. Finally, in the last pair of columns are shown the 50–50–50 MPN values for each run calculated from the nomographic method of Thomas,[14] and the corresponding ratios. The nomographic method gives MPN values that are identical with those of the MPN tables[3] and may be used for decimal dilution tube combinations not covered by the published tables.

Discussion

The data are of interest in that they indicate a significant degree of positive

Table 1—Averages of Plate Counts and MPN Determinations for 15 Coliform Suspensions

		Arithmetic		Geometric		Median		Harmonic					Nomo-	
	Agar	Mean	(2)	Mg	(4)	Md	(6)	Mh	(8)	50 Tube	(10)	graphic	(12)
Run	Count/ml	MPN/ml	(1)	MPN/ml	(1)	MPN/ml	(1)	MPN/ml	(1)	MPN/ml	(1)	MPN/ml	(1)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1	74.5	91.8	1.23	83.7	1.12	79	1.06	75.1	1.01	69	0.93	81	1.09
2	55.2	60.1	1.09	55.2	1.00	49	0.89	51.3	0.93	52.5	0.95	53	0.96
3	78.7	132	1.68	112	1.42	87	1.10	96.9	1.23	81	1.03	103	1.31
4	79.3	85.9	1.08	69.8	0.88	64	0.81	56.3	0.71	60	0.76	69	0.87
5	48.3	51.8	1.07	41.1	0.85	39.5	0.82	35.0	0.72	42.7	0.88	40	0.83
6	68.7	140.8	2.05	109.5	1.59	110	1.60	94.7	1.38	77	1.12	100	1.46
7	36.5	53.8	1.47	42.2	1.16	33	0.90	36.3	1.00	43.4	1.19	40	1.10
8	5.0	5.37	1.07	4.55	0.91	4.9	0.98	3.9	0.78	4.6	0.92	4.2	0.84
9	4.9	7.89	1.61	6.92	1.41	7.0	1.43	6.1	1.24	5.9	1.20	6.4	1.31
10	65.7	72.2	1.10	57.6	0.88	56	0.85	47.0	0.72	52.6	0.80	54	0.82
11	45.2	56.3	1.25	49.3	1.09	49	1.08	45.6	1.01	49.6	1.10	50	1.10
12	11.6	15.3	1.32	13.5	1.16	13	1.12	12.1	1.04	8.7	0.75	11.5	0.99
13	10.7	11.5	1.08	10.1	0.93	13	1.21	8.1	0.76	7.8	0.73	9.2	0.86
14	129.9	141.7	1.09	126	0.97	110	0.85	112.5	0.87	89	0.69	113	0.87
15	99.8	115.2	1.15	106	1.06	115	1.15	96.3	0.96	69	0.69	120	1.20
Mean ratio			1.29		1.10		1.06		0.957		0.916		1.04
Range			1.07–2.05		0.85–1.59		0.81–1.60		0.71–1.38		0.69–1.20		0.82–1.46

bias in the MPN test. The magnitude of the bias depends upon the type of statistical treatment to which the MPN replicates are subjected. The arithmetic mean has the greatest bias and the harmonic mean the least. Column 3 shows that in every comparison the MPN average is higher than the plate count mean, ranging from 7 per cent to 105 per cent, with an average overestimation of 29 per cent. The harmonic mean, the geometric mean, and the median exhibit a low amount of bias. This is in agreement with the theory of sampling of these estimators from a log-normal distribution such as that of replicate MPNs. Column 5 shows that the geometric mean of the MPN replicates is on the average 10 per cent higher than the plate count mean, with eight of the ratios greater than unity and seven equal to or less than unity. Note the close agreement between the ranges obtained in Columns 5 and 7. In the 50–50–50 tube test (as obtained by amalgamating results from all tubes into a single MPN) the bias factor is 4 per cent (Column 13). This is in accord with the MPN theory which indicates that bias of the mean MPN decreases as the number of tubes in each dilution is increased. Theoretically, with a very large number of tubes in each dilution, the bias would become negligible and the mean of the MPN would be equal to that of ideal plate counts assuming equivalent coliform growth. The mean of the last column of Table 1 (1.04) indicates that the growth efficiency in the tubes was very nearly equal to that on the plates. The important demonstration of the investigation is this: that the MPN consistently overestimates true density to a degree of positive bias closely equal to that predicted by mathematical analysis, and that to obtain best estimates equal to an ideal plate count, the proper bias correction should be applied to the MPN value obtained.

The short approximate formula of

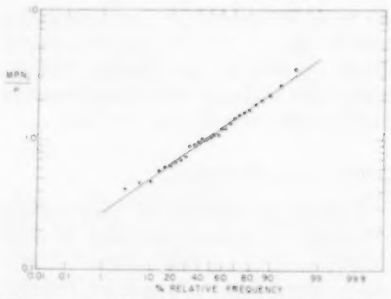

Figure 1—Cumulative Frequency Distribution of Ratios of MPN per Average Plate Count, 15 Coliform Suspensions

Thomas for calculating MPNs appears to underestimate slightly the coliform density of a sample. Low results were obtained in 10 out of the 15 samples, with an average underestimation of 8.4 per cent. This amount of bias, like that of the median, the geometric mean, and the harmonic mean, is significantly smaller than that of the arithmetic mean. It is pertinent to note that the range of the Thomas density estimator (Column 10) is narrower than that of any of the other estimators.

It should be remarked that in ordinary water potability analysis, replicate MPN determinations are not usually made, and the median, the geometric mean, and the harmonic mean cannot be computed. It is possible, however, to reduce the bias error by application of the bias correction factor, $e^{-0.805/n}$, or by use of the approximate formula.[13]

B. Individual MPN Dispersion about the "True" Density

To observe the correlation existing between a single MPN and the "true" density of coliforms existing in a sample, the following treatment of the data was conceived. Using the arithmetic average of the agar plate count as the "true" density of each suspension of pure culture, the ratios of each MPN value to "μ" was calculated for each run. One hundred and fifty ratios, MPN/μ, were obtained; these yielded an arithmetic

Table 2—Ratios of MPN to Average Plate Count * for Replicate Tests with 15 Coliform Suspensions

Run	Ratio, MPN/ (Average Plate Count)										Average
1	1.06	1.48	1.48	1.06	1.06	2.28	1.75	0.44	0.66	1.06	1.23
2	1.27	0.60	0.89	0.89	0.60	2.00	0.89	0.89	0.89	2.00	1.09
3	0.89	0.62	1.00	1.21	3.56	1.00	3.05	1.00	1.65	2.80	1.68
4	1.00	2.14	0.62	0.62	0.58	1.64	2.14	0.42	1.39	0.29	1.08
5	0.48	1.01	3.52	0.48	1.63	0.95	1.01	0.48	0.48	0.68	1.07
6	2.04	1.15	7.90	0.71	1.60	1.02	1.60	1.89	1.60	1.02	2.05
7	1.34	4.66	0.91	0.91	0.91	3.02	0.63	0.91	0.63	0.85	1.47
8	0.46	0.98	0.98	0.66	0.46	0.46	0.98	2.60	1.53	1.53	1.07
9	3.48	0.67	2.25	1.00	1.43	1.43	1.93	1.00	0.67	2.25	1.61
10	0.37	0.49	0.49	1.97	0.47	1.20	1.20	1.68	2.59	0.49	1.10
11	3.76	1.08	0.73	0.73	1.08	1.08	0.73	1.08	1.08	1.08	1.25
12	1.12	1.46	0.68	1.12	3.02	0.68	0.60	0.95	1.46	2.07	1.32
13	1.21	1.21	1.03	1.59	0.31	1.59	0.74	1.59	0.31	1.21	1.08
14	0.54	0.61	1.85	0.85	0.61	1.85	0.85	0.61	1.85	1.31	1.09
15	1.10	0.70	2.10	0.95	0.70	1.30	1.70	0.47	1.30	1.20	1.15
Average											1.29

* Average plate count = arithmetic mean of 10 replicate plate counts.

mean of 1.29. Table 2 presents all the ratios, listed according to run and sequence of appearance. The average ratio of each run is presented in the last column and corresponds to Column 3 of Table 1. Figure 1 was prepared by arraying the 150 values of Table 2 and plotting every fifth value against the appropriate percentile on log-probability paper. The line was fitted by eye.

Discussion

Table 2 indicates the wide variation that can be expected in replicate MPN determinations. Only 11.3 per cent of the ratios exhibit an agreement of less than 5 per cent, 21.3 per cent of the ratios show an agreement of less than 10 per cent, and 60 per cent of the ratios show an agreement of less than 50 per cent; so that 40 times out of 100, a bacteriologist, while employing the MPN procedure with a 5–5–5 set of tubes, can expect a disagreement of more than 50 per cent between the result obtained and the result which could have been expected from the colony count method as used in these experiments. A further analysis of this table shows that 28 out of the 40 determinations which yielded a 50 per cent disagreement could be expected on the positive side and only 12 could be expected on the negative side. This accords with the theoretical distribution of replicate MPNs which is skewed on the positive side.

Figure 1 shows that approximately half of the ratios are less than one and the other half more than one. The 50 percentile value on the plot is about 1.05. The 95 per cent limits for the plot are 0.33 to 3.3. This range is in excellent agreement with the theoretical 95 per cent confidence limits of the MPN procedure, commonly taken as 0.3 to 3.0. The geometric standard deviation of the fitted line of Figure 1 is

$$X_{84}/X_{50} = 1.9/1.05 = 1.81$$

and is in excellent accord with the theoretical value of 1.77.

The agreement with theory is entirely satisfactory and reinforces the conclusions in foregoing and subsequent sections of this presentation.

C. Reproducibility Associated with the Colony Count Procedure

Table 3 presents the standard devia-

Table 3—Statistical Analysis of Replicate Plate Counts of 15 Coliform Suspensions

Run	Colony Count Method			Dilution Method
	Standard Deviation	Lexis Ratio	Range (ct/ml)	MPN/100 ml Range
1	4.38	0.51	65– 80	33–170
2	5.58	0.75	47– 64	33–110
3	9.40	1.06	62–105	49–280
4	7.73	0.87	66– 87	23–170
5	8.79	1.26	35– 61	23–170
6	7.76	0.94	50– 78	49–540
7	5.11	0.85	27– 42	23–170
8	2.21	0.99	1– 8	2.3– 13
9	2.47	1.12	1– 8	3.3– 17
10	8.43	1.04	54– 84	31–170
11	5.38	0.80	36– 53	33–170
12	3.75	1.11	7– 17	7– 35
13	2.45	0.75	7– 15	3.3– 17
14	14.7	0.78	105–149	70–240
15	7.45	1.34	92–110	47–210
Average		0.95		

tion and Lexis ratio range of the agar plate count data for the 15 runs and the range of the MPN data for each corresponding run. The Lexis ratio is that of the standard deviation to the square root of the mean count. The Lexis ratio is a measure of "overdispersion" relative to results expected in sampling a random (Poisson) distribution of bacteria. The Lexis ratios in Table 3 are clustered about unity and indicate no significant overdispersion such as may occur in routine analysis (pipeting error, etc.).

Comparison of the ranges obtained by the two methods of density estimation definitively indicates that the degree of reproducibility associated with the colony count procedure markedly exceeds that of the MPN test. The median ratio of the 15 runs between the high and low plate count is 1.55, while the median ratio between the high and low MPN is 5.55. These results are in excellent agreement with the expected ratios of $61/39 = 1.57$ for plate counts and $120/21 = 5.71$ for MPNs.

D. The Reproducibility of Pairs of MPN Determinations

In the course of a study on the storage of bacterial samples,[15] 570 pairs of MPNs were inoculated from one surface water source over a period of 12 months. Of these, positive results were obtained in each of 539 pairs. The ratio of the second of each pair to the first was calculated, and the resulting 539 ratios were arrayed in order. Each 11th value was then plotted against its appropriate

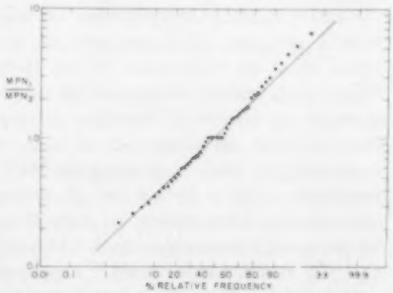

Figure 2—Cumulative Frequency Distribution of Ratios of Duplicate MPN Values

percentile on log-probability paper, as shown in Figure 2. The straight line shown in the figure represents the theoretical value for a ratio of MPNs of two 5-tube, 3-dilution MPN tests.

Discussion

The theoretical line in Figure 2 has a geometric standard deviation of $1.77^{1.414}$, or about 2.3. The dispersion of test results is larger in this plot than in Figure 1, since a ratio of two MPNs is plotted and variance is introduced by each.

Conclusions

The laboratory results for replicate plate counts and fermentation tube tests are in close agreement with statistical theory. A substantial mathematical bias in MPN values relative to plate counts is experimentally demonstrated. The magnitude of bias is shown to be dependent on the method of statistical analysis to which the MPN data are subjected. The arithmetic average of 10 replicate MPNs resulted in an average 29 per cent positive bias with the agar plate count method as the control estimator, and the geometric mean, the median, and the harmonic mean of the 10 replicate MPNs indicated an average bias of + 10 per cent, + 6 per cent, and —4 per cent respectively.

The precision of plate counts in the range of coliform densities investigated was found to be at least three times as great as that of replicate 5–5–5 tube MPN values. The colony count methods were shown to be theoretically desirable, but because of certain imperfections and limitations associated with their practical application they have not been adopted as standard coliform procedures.

The most important conclusion of this evaluation of direct colony count vs. dilution method is the recognition of the enormous area that is available for improvement in the estimation of the sanitary pollution parameter. A method is needed that will embody greater precision than the MPN procedure and that will also allow the cultivation and enumeration of all strains of the coliform group. The membrane filter technic appears to possess the greatest potential for fulfilling these requirements.

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Medical expense insurance has been proposed to help reduce the risks of sudden large medical bills. This paper explains how it works.

MAJOR MEDICAL EXPENSE INSURANCE

Charles A. Siegfried

THERE IS EVIDENCE that the medical bills of families in the United States currently average about $250 a year. The range of expense incurred by particular families is, however, very broad. Some fortunate few have little or no expense; a large number incur expenses of more substantial but still fairly modest amounts. The great hazard faced by all families is that circumstances may arise involving medical expenses well above the national average; in some cases the amounts may be staggering. Bills may exceed a large part or all of a year's earnings. They may wipe out substantial savings entirely. They may spell heavy, ruinous debt and all sorts of hardships.

The purpose of medical expense insurance is to reduce these risks by spreading at least some of the costs over a large number of people. There are many different ways in which this can be done, and because this is so, there are many varieties of insurance and prepayment plans. Some plans deal with only hospital bills, some deal only with surgeons' bills. Some aim to provide only a modest level of benefits. The simple fact is that many current plans deal with but a part of the problem faced by most families. Studies show that hospital expenses account for only about 20 to 30 per cent of the total cost of all medical services, and surgical expenses for about 10 to 15 per cent. Plans which deal with only these types of expense naturally leave important areas unprotected.

Major medical expense insurance takes the broad approach. It aims to deal with nearly all the types of medical expense which a family might incur. Then, also, it aims to give special emphasis to benefits where severe or prolonged illness is involved. It is a comparatively new development but one which has already been tested extensively and successfully. Its roots are grounded in sound experience with earlier and simpler forms, and it is showing much promise as a most effective means for dealing with current and future medical expense insurance needs.

Table 1 gives the highlights of a particular major medical expense insurance plan. While insurance of this type is available to individuals under individual policies, it is currently more commonly offered on a group plan basis. This illustrative plan is substantially identical with the plan pioneered by the General Electric Company in 1955, although the plans of a considerable number of other companies covering their employees and the dependents of employees are the same or are essentially similar to this illustration.

Noteworthy Characteristics

The noteworthy characteristics of this type of plan are as follows:

1. Its protection covers a broad variety of medical expenses and extends far beyond the hospital-surgical category, which is the only category of expense covered by many current plans.

2. The aggregate value of benefits a particular individual may receive is far above that of many other plans. The plan aims to be especially helpful where the expenses incurred are high because of the severity of the accident or illness or because of its prolonged duration.

3. By not undertaking to pay the first $25 or $50 of expense in a particular calendar year, the effectiveness of the plan is not diluted by the large number of cases where the expense incurred is small and where the administrative overhead would naturally be high in relation to the medical expense. To cover such cases would add substantially to the cost of the plan without adding commensurately to its value as insurance.

4. In most situations the insured is responsible for meeting a part of the aggregate expenses. This is referred to as the coinsurance element. This is a practical measure adopted in view of the subjective elements inherent in medical care and in the belief that the individual desirably should continue to have a responsibility through a financial interest in the kind, volume, and quality of medical care.

5. There are no limitations or restrictions on the insured in his selection of physician, surgeon, or nurse, or in the selection of the hospital in which care may be rendered—other than that these be duly licensed under any applicable laws.

6. There is no surgical fee schedule or other similar limitation which might affect either the selection of the surgeon or the type or quality of service. The plan attempts to deal with expenses as they might normally be incurred and does not in any way seek to modify the patterns of medical practice or the fees charged. The only stipulations are that the services rendered be necessary in the judgment of the attending physician and that the fees charged be the regular or customary fees for the services rendered.

7. The scope of the benefit provisions is such that it minimizes any tendency of the plan to influence the type of treatment utilized. Coverage is extended to care at home or at the doctor's office as well as in a hospital.

Bringing Medical Bills within Manageable Bounds

The plan works very simply, as follows: For each member of the family, the plan picks up 75 or 85 per cent of the medical bills incurred in any year above the deductible amount for which the individual is responsible. The deductible amount may be as little as $25 and no more than $50, depending on the kind of expenses involved. The aggregate benefits paid may run as high as $15,000!

The great value of insurance of this kind lies both in the advance assurance of substantial financial help in time of need and in the actual delivery of benefits when the unexpected occurs. It is a powerful means of keeping the financial problems of illness and accident for large numbers of families within limits they can manage—problems which in the absence of such insurance would cause the severest kind of distress.

Of primary importance, perhaps, is the value of major medical expense insurance in cases of extremely severe accident or illness where expenses running into thousands of dollars are involved. For most families faced with such a predicament, the plan gives welcome assurance that the costs the family must undertake directly are brought within reasonable and manageable limits. Consider a case where medical expenses of, say, $5,000 are incurred. The plan might pay about $4,000, leaving $1,000 for the family to pay.

The seriousness of an outlay of even these limited proportions is of course recognized. However, there is a tremendous difference between medical bills of $5,000 and bills of $1,000. By making up the difference, the plan is rendering an insurance service of incalculable value. Cases involving an expense this great do not occur frequently, but when they do occur, the plan reduces what otherwise might be a hopeless burden to one of manageable proportions. In the great majority of cases, medical bills are at much lower levels, and in these cases the residual burden of medical expenses not covered by plan benefits is brought within easily managed limits.

No amount of medical expense is incurred without a corresponding amount of inconvenience and even hardship. In almost every case, money spent for medi-

cal care is money that is not available for goods and services a family needs or cannot readily forego. There is, however, a level of expense that a family can meet without ruinous dislocations to its standard of living. An illness which takes away several hundreds of dollars in savings spells disappointment, but many families have demonstrated that they can cope with expenses of this magnitude.

Today, through the use of instalment credit or "easy payment" plans, many "average" families are purchasing goods of one sort or other involving several hundreds or thousands of dollars beyond their immediate capacity to pay in cash. This furnishes us some measure of the capacity of families to absorb medical expense without facing a ruinous situation, although we of course recognize that such comparisons have serious limitations. Nevertheless, we might regard a plan as highly effective if it brought otherwise hopelessly catastrophic cases within the range of expense that many families have demonstrated they can deal with in some fashion. Major medical expense insurance does just that. In most cases this insurance makes it possible for a family to continue the normal standard of living despite severe or otherwise costly illness.

The value and effectiveness of major medical expense insurance is not diminished because proportionately few families are the victims of extreme, catastrophic situations. These are families whose medical expenses are far above the average and far beyond their own resources. The problem presented by these families is particularly difficult inasmuch as there will be some among their number whose expenses are without measurable limit due to such causes as mental illness or severe chronic illness of long duration.

In view of the many uncertainties as to what is really appropriate in such cases and because the outlays can be so large, there is a practical need to place some limits on the extent of the coverage that can be provided under any kind of insurance or prepayment plan. We seem forced to conclude that there are some unfortunate families whose needs are so great that they cannot hope to meet them by their own or other private means but must look to the community at large or to the state to provide institutional care. Whether this always must be so should not be regarded as settled—this problem is a complex one, one which is currently under attack, and there is a sound basis for optimism that the boundaries for private, nongovernmental methods of dealing with it can be continually pushed further ahead. Major medical expense insurance has already pushed these boundaries substantially ahead, and in addition shows the potentiality for further movement.

The Balanced Objectives of Major Medical Expense Insurance

By their nature, all insurance and prepayment plans are mechanisms for spreading the risks to which the participants are exposed—mechanisms for leveling the peaks and valleys of costs that are likely to be incurred over the years. Whatever is paid out in benefits must be contributed in one way or another by or in behalf of the participants. If a plan is expanded to provide greater benefits, the cost will be correspondingly higher and the contributions must be correspondingly greater.

To test the effectiveness and value of a particular plan, it should be measured not against some absolute standard (such as, does it pay all medical bills?), but by a balancing of the positive benefits it provides against the contributions it requires. If there were no practical considerations governing the limits of contributions, a plan undertaking to pay all medical bills might be considered. However, analysis indicates that the cost

would be substantially above what people generally would be willing to pay under current conditions. No one by having small bills paid under such a plan would be helped sufficiently to make the additional costs of paying such small bills in this way attractive.

More importantly, it is by no means certain that full-payment or full-service plans are the best solution to the problem of medical economics, entirely aside from the cost aspects. Currently there does not exist, in medical circles or elsewhere, any well defined standards of the kinds, quantity, and quality of medical care needed or required in dealing with various medical conditions. Because this is so, there seems to be no satisfactory alternative to having each individual participate in the decisions that have to be made by assuming a responsibility for deciding how his money should be spent. In many cases the deductible or coinsurance features have little or no practical effect on the medical decisions made, and properly so. But there are an important number of cases where there are reasonable alternatives—for example, whether the patient at home should be cared for by the family or whether special nurses should be employed. There are numerous subtle factors bearing on these situations, but many will recognize situations where families will prefer a less costly arrangement to a more costly one when the more costly one means giving up other things that either are more urgently needed or are preferred.

Major medical expense insurance aims to help people make the most effective use of the money required directly or indirectly for medical bills. It does this by taking the broad approach, encompassing all types of expense; by striking a balance in the distribution of benefits between the severe type of case and cases where insurance protection is less urgently needed; and by encouraging people to act wisely and with discrimination in the expenditure of money for medical care.

Comparison with Alternative Types of Plans

It is only natural that other types of plans should be considered as alternatives to major medical expense insurance. Many different groups of people are affected by the need for medical care and the problems of providing it, and many different minds have given thought to how best to deal with these matters. Medicine and medical care are not settled quantities but are evolving and changing, in many respects quite rapidly. It is pertinent, therefore, that major medical expense insurance be judged in relation to other alternatives. An alternative plan might well be examined in the following respects:

1. Is it primarily an attempt to solve the problems in just one area of medical care—hospitalization, surgery, etc.—or does it aim to deal with the broader problems faced by the average individual?
2. Is its primary purpose one of helping a particular type of institution or panel of practitioners, or is its primary purpose one of helping with the broad problem of medical bills that most people may encounter?
3. Is it a plan which is flexible to adjust to the rapid changes in medical service and practice which have been taking place?
4. Is it a plan which can be applicable without delay over a wide area of the country, or is it a plan which can be made available only within a limited area?

These questions touch on matters of great importance and of no little delicacy. They can be the cause of considerable emotionalism on the part of the proponents of a particular plan. The fact that numerous groups and agencies have been developing and advancing particular types of medical expense plans has been generally beneficial to the people of this country. In this process of trial and competition, much of value has been learned about the basic principles necessary for soundness and satisfaction.

Consequently, we have today a better understanding of the criteria appropriate for judging different plans. The features of major medical expense insurance which appear to be significant and of important long-range value from the standpoint of the public interest as a whole may be summarized as follows:

1. Major medical expense insurance is constructed on sound risk-spreading principles as derived from a long history of successful insurance practice;
2. This type of insurance is not subsidized or dependent in any way on special advantages from the standjoint of state or federal taxation;
3. It does not aim to control or interfere in any way with the normal practice of medicine or with the evolutions and improvements in the field of health and medical care;
4. It is not controlled by or restricted to any panel of medical practitioners or group of medical institutions;
5. It fits all communities large or small, does not require the formation of any new organizations;
6. It can be modified or tailored in many different ways to accommodate the varying needs and desires of different groups of people.

We must recognize that there are those who feel that the problems of medical care and health are such as can be dealt with satisfactorily only under some form of compulsory governmental plan. Major medical expense insurance is based on a different concept, one which attempts to make as unnecessary as practicable the role of government in so personal a matter as medical care—recognizing, of course, that there are some areas where government activities are definitely proper, not the least of which is the area of public health, involving the prevention and control of epidemics and so forth. Hence, major medical expense insurance aims to develop a plan which can be supported by nongovernmental means, which is efficient and equitable in its operations, and which provides a flexible mechanism for expanding the area of coverage just as far as individuals and groups find it within their means and desires to do so.

Now there are those who genuinely are not seeking a governmental-type plan as the answer to medical cost problems, who recognize the practical reasons for the use of the deductible and coinsurance elements in major medical expense insurance plans, but who feel that other quite different approaches are needed. As previously indicated, it is desirable that other approaches be tried. Some plans that are receiving considerable attention involve an organization of medical facilities which undertakes to furnish a broad scale of specified medical services for specified subscription charges. Under plans of this kind the managers of the plan and the participating practitioners are in a position to exercise great power in controlling the quantity and quality of services rendered. This is not to say that such plans cannot render a high quality of service. However, the individual or group seeking medical care and a mechanism for dealing with medical care costs will want to weigh carefully such considerations as the following:

1. Do we wish to have a maximum degree of freedom in choosing our physician, our hospital, and our nurse, or will we be satisfied to limit our selection to the participating members of a service pla ? Do we wish to have the same freedom in dealing with medical practitioners and the suppliers of medical services as we have in obtaining other goods and services? Do we wish to be committed to a particular group of suppliers of service for extended periods without having the right to change if the service rendered does not appear satisfactory?
2. Are we satisfied that a single service plan which gains a monopolistic position in a community or wider area can be expected to maintain high and improving standards of performance over a period of years? Where such plans are in active competition with other plans or other practitioners, the public has protection against exploitation. But is it practicable in many areas to have competing plans of this type?
3. Can any plan be organized efficiently and effectively to undertake as broad a range

Table 1—Outline of Illustrative Major Medical Expense Insurance Plan

I. Expenses Covered	
Type A Expenses:	Hospital room and board, special hospital services, surgical fees.
Type B Expenses:	Physicians' fees other than surgery, x-rays, and other types of diagnostic services out of hospital, drugs and medicines, professional ambulance service, registered nurses, artificial limbs and other prosthetic appliances.
II. Benefits	
For each individual covered during calendar year—	
Type A Expenses:	Employee pays first $25; Plan pays next $225 in full; Plan pays 85 per cent of excess.
Type B Expenses:	Employee pays first $50; Plan pays 75 per cent of excess.
For maternity—	
Type A and Type B Expenses:	Normal delivery, $150; Caesarean section, $225; miscarriage, $75. Where there are severe complications, Plan pays 75 per cent of expenses for such complications in excess of $150.
Maximum benefits—	$7,500 in any calendar year; $15,000 aggregate.
III. Expenses Not Covered	Dental care (except due to accidents), eye glasses, health check-ups, expenses paid by government or other employer plan.
IV. Estimated Monthly Cost	Depending on nature, location, and composition of group insured, cost of employee coverage will range from about $3.50 to $5 a month; employee and family coverage from about $10 to $15 a month.
	During a calendar year there will be about 100 claims per 1,000 employees, and there will be about 260 claims per 1,000 employees with families for benefits on account of family members other than the employee himself.

of medical services as the public needs or desires? Most plans with which the public has had any experience to date provide a relatively limited scope of services or involve a limited selection of practitioners.

Major medical expense insurance, in contrast, gives the individual all the freedom he customarily expects and enjoys. It does not aim to relieve him of all responsibility for his bills, but it makes his financial situation manageable. It enables him to consult medical practitioners with freedom and dignity. The scope of the insurance can be as broad or as limited as he may desire. In the development and growth of plans of this kind, balance is involved at each step—as benefits are extended the premiums naturally go higher. Each participant consequently feels a tighter pinch on his pocketbook nerve. The question, where the proper or desirable line of balance should be drawn, admits of many answers and perhaps some considerable experimentation and experience. That is the process we are witnessing at the present time.

Preventive Care

The development of major medical expense insurance reflects a long and constructive record of interest on the

part of insurance companies in the health of the American people. Through health pamphlets, health demonstrations and educational programs, support for medical research, and in numerous other ways, insurance companies have provided leadership in dealing with the problems of health and medical care.

The fact that major medical expense insurance plans do not aim to cover routine health check-ups or routine preventive health services is not due to any lack of concern for such matters. Rather it is based on experience which demonstrates that there is no true need to deal with relatively small and routine expenditures by insurance and that to do so is wasteful and not in the public interest.

There is no greater need for insuring or prepaying certain kinds of medical bills than there is for insuring or prepaying the plumber, the painter, the garageman, or any of the numerous kinds of expenses incurred by individuals which are not of a uniform or regularly recurring nature. To deal with such expenses through insurance or some other plan just adds additional fixed costs on the family budget and represents an indefensible procedure. There is no advantage or gain commensurate to the additional expense involved.

Other Types of Major Medical Expense Insurance

The plan described in Table 1 is just one type of plan that can be devised. Many variations, each having some special merit, are possible and have in fact been adopted. One important type of variation is described in Table 2. This is a type of plan which can be adopted with a minimum of disturbance where there is an existing plan of a limited nature that deals with, say, only hospital or surgical expense and where practical considerations make it undesirable to adopt a composite plan of the kind described in Table 1.

Generally speaking, the difference between the Table 2 plan in conjunction with a basic plan and the Table 1 plan is that the former may provide somewhat greater emphasis on hospital and surgical expenses, including cases where such expenses are relatively small. In so doing, less may be provided for the more severe cases or for cases where hospital and surgical expenses are not involved. Many variations are possible, and a plan of the Table 2 type can be devised which will offer substantially all the advantages of major medical expense insurance discussed in this paper.

Table 2—Outline of a Major Medical Expense Insurance Plan Supplementing a Basic Plan

I. Basic Plan Benefits

A. Hospital Benefits

Hospital care in semiprivate accommodations up to 120 days.

B. Surgical Benefits

Benefits up to $300 in accordance with a specified schedule depending on type of operation.

II. Major Medical Expense Insurance

A. Type of Expenses Covered

Hospital and surgical charges not covered by the basic plan. Other expenses of types covered by Plan referred to in Table 1.

B. Benefits

Employee pays first $100 of expense above that covered by the basic plan; Plan pays 75 per cent of excess. Maximum benefits, $5,000 in any calendar year; $10,000 aggregate.

III. Estimated Monthly Cost

Depends on nature, location, and composition of group insured, and on provisions of the basic plan. For a plan as outlined, the cost of the basic benefits and major medical expense insurance benefits combined would probably be somewhat, but not substantially, higher than the plan described in Table 1.

Summary and Conclusion

The problems inherent in meeting the costs of medical care are highly complex

because they involve all the vagaries of human nature and a state of medical knowledge and practice that not only has many ramifications but is in course of numerous important changes. There is great variation in the economic situation of the people who desire a means for dealing with these problems. A tremendously important group is composed of those who are employed or are members of a family whose head is employed. There is a wide range of attitudes as to how medical care should be rendered and paid for, although it seems clear that the great majority of people strongly desire to retain a high degree of freedom of action in dealing with their personal medical needs and in dealing with the many different persons, organizations, and institutions that are providing medical services. While the range of medical needs is so broad that there appears to be an area (even beyond the public health concept referred to) that can be dealt with only by public means, the great majority of people seek a way of making this area as small as practicable. There is also a wide range in the nature, quality, and quantity of medical services normally used by people in different towns, cities, and sections of the United States.

Conclusion

Major medical expense insurance is a recently developed but powerful mechanism for dealing with the costs of medical care. Among its merits are the following:

1. It makes possible keeping the cost of medical care for the great majority of families within manageable limits that can be dealt with by the resources of the family without recourse to charity, government aid, or other subsidy.

2. It fits in with existing patterns of medical care. It does not depend on new and still to be developed medical organizations or types of practice. It enables physicians, hospitals, and all other medical agencies to evolve and grow as they would normally.

3. It gives to the individual the same freedom of choice in the selection of a physician and medical services he would normally have. In fact, to the extent that money is available in amounts and circumstances in which it would not normally be available, the individual's freedom of choice is enlarged.

4. It has great flexibility to fit varying concepts of need and desire for the spreading of risk and sharing of costs.

5. It has great flexibility to accommodate to changes in medical service and practice.

6. It is efficient and conservative in operation, providing reasonable safeguards against waste and ineffectiveness. It encourages the most effective use of the available medical facilities.

7. It is made available by insurance companies operating under the supervision of insurance departments of the various states in free competition in accord with the traditions of American enterprise.

8. It is not a theory or a dream but a vigorous reality that is rendering effective and satisfactory service to millions of persons right now.

9. It does not claim to be the only mechanism for dealing with the costs of medical care, but it does claim a combination of qualities that will make it appeal strongly to rapidly growing numbers of people in the period ahead.

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This paper was presented before a Joint Session of the Association of Labor Health Administrators and the Medical Care Section of the American Public Health Association at the Eighty-Fifth Annual Meeting in Cleveland, Ohio, November 13, 1957.

What is the situation of migrant agricultural workers with respect to health insurance? The present study reports the experience of a number of insurance companies with this group of workers and reviews some of the problems revealed.

THE MIGRATORY WORKER AND HEALTH INSURANCE

J. F. Follmann, Jr., F.A.P.H.A.

In 1956, President Eisenhower appointed an Interdepartmental Committee on Migratory Labor. The purpose of the Committee is to attempt to find means of improving the lot of the migratory farm laborer. One of the matters of concern is medical and health care for these people and how to finance it. Inherent in such consideration is an exploration of the feasibility of providing health insurance for these workers. The purpose here is to explore this possibility.

Today there are an estimated 1.25 million migrants in the United States, of which 0.5 million come into the continental United States from other countries or commonwealths for certain periods each year. Most migrants in this latter group come from Mexico, although Canadians and British West Indians are also included. With respect to the Mexicans and West Indians, they are usually single men, reportedly physically screened, who come into the country on contract, with minimum housing, transportation, and wage requirements and with Workmen's Compensation and health insurance protection stipulated or provided. In the case of Mexicans, recruitment is through the U. S. Secretary of Labor working with the Mexican government. The employment period is stipulated, varying from six weeks minimum to six months maximum. The United States pays for basic transportation costs and guarantees that the employer will fulfill his contract.

More recently 100,000 Puerto Ricans have become available, of whom about 15,000 are currently employed in the United States. Employment is arranged through the various state employment services. The Puerto Rican Employment Service covers these workers under a group insurance contract for hospitalization, surgery, outpatient care, doctors' calls, loss of weekly income, and death; the employer being required to deduct $0.74 a week for remittance to the insurance carrier.

Since these workers, with the exception of the Canadians, are automatically insured, they present no further concern from the standpoint of this exploration.

The remaining 0.75 million migratory workers are United States citizens who seldom work under contract, are difficult to identify as such, often are in family units, and at times present a serious social problem as well as a health problem, not only on a national but also on a local community basis. They are presumed to be seldom protected by health insurance, although many are known to be covered by individually purchased insurance. These workers have been described in several publications. One study indicates their total to be 450,000 adults, 100,000 children under

Table 1

Atlantic Coast	Chiefly Negro families
Texas to the North Central and Mountain States	Spanish-American families
Texas to Montana, North Dakota, and Canada	Men alone
Texas to California and the Mississippi Delta	Spanish-American families
South Central to North Central States	Anglo-Saxon families
South Central States, Arizona, California, and other Western States	Spanish-American, Negro, Indian, Anglo-Saxon, Oriental, and Filipino families

the age of 14 traveling with the adult workers, and 200,000 dependents who stay at home. The diversity of populations which comprise the migratory workers is evident from the distribution by areas as shown in Table 1.

Generally, these workers possess a low degree of education, the median for all ages being 4.8 years of schooling.* Annual earnings are low, due in part to the highly seasonal nature and the short duration of the work (90 per cent average 101 days work). A large number of females are to be found in the group, and families are large, running five to seven persons. Travel facilities, housing, general living conditions, nutrition, sanitation, and health care are usually substandard. Hence, a high incidence of illness and accidents is found among the migratory workers. Few are immunized against the communicable diseases, and diarrheal, respiratory, and venereal diseases are common. Infant mortality is high. Residence laws usually bar them from welfare aid. Few of the workers actually qualify for OASDI benefits, few child labor laws are applicable to them, not all state Workmen's Compensation laws are applicable, very few minimum wage laws apply to them, and no unemployment compensation or temporary disability benefit laws are applicable. For the most part, the workers work through crew leaders and apparently do not stay in the migratory stream too long, one study showing the following:

31	per	cent	in	the	stream	1–2	years
22	"	"	"	"	"	3–4	"
15	"	"	"	"	"	5–6	"
12	"	"	"	"	"	over 10	"

These migratory workers of both general types constitute a necessary part of our labor force, one estimate being that they contribute 7 per cent of our farm labor force. They make an important contribution to our national economy and perform valuable seasonal service to farmers and processors of farm products in certain parts of the country.

In an endeavor to accumulate as much useful information as possible about the coverage of these migrants by health insurance, 167 insurance companies writing health insurance and one Blue Shield plan known to have had broad experience with migratory workers were queried about their experiences with these workers. It was hoped that the investigation would not only shed some light on the degree to which these people are insured, but that it would furnish useful data and opinions of assistance to insurers and others concerned with the welfare of migrants.

Insurance Company Experience

Of the insurance companies queried, 150 replied that they have not to their knowledge insured any migratory workers. Seventeen of them stated that because of their method of operation, the questionnaire was inapplicable to them. The reasons for this varied: some write

* Exceptions are the students and teachers who each summer join the migratory worker pool.

insurance in Canada only, some do not operate in the areas where migratory workers are usually employed, and some write reinsurance only.

Seventeen insurance companies queried replied that currently they had insured some migratory workers. Nine others reported that they had insured migratory workers at some time in the past. Eight reported that they had at some time attempted to or considered insuring migrants but had not been successful in putting their considerations into effect. Eighty-nine stated they had never had any request or demand for such coverage, although some of these indicated they would be willing to consider such requests. Twenty-seven said they presently consider migratory workers uninsurable, giving the following reasons for their opinion:

The absence of a permanent residence or address makes the administration of an insurance mechanism difficult, if not impossible. Because of this, the payment of claims, the servicing of the policyholder, and the collection of premiums would be extremely difficult. For this reason, also, it is difficult to place insurance on these people in the first instance. (It is to be noted that this handicap on the part of migratory workers probably is not limited to health insurance but that it probably also affects such matters as social security and other social insurance payments and benefits, public assistance, public health services, education of children, and tax collection.)

The persistency on such insurance would be too low to make it possible to write the insurance at a premium which these persons could afford to pay. (Persistency, or the periodic renewal of the insurance, is necessary to a reasonable degree in order to maintain the cost of insurance at an affordable level. Insurance which is renewed by the insured sporadically or not at all becomes too costly because of the expense of issuing the policy and establishing all the necessary initial records. This would be equally true of any government-operated plan.)

The costs of writing such insurance, for the reasons stated, would make the cost prohibitive to these persons on an individual policy basis.

The seasonal nature of the work, resulting in an absence of permanent employment, would make the writing of loss-of-income protection difficult due to the difficulty of defining disability.

The absence of an employer, in the more customary long-range sense, to whom the policy could be issued and who would be responsible for premium payments, would make the writing of group insurance on migratory workers very difficult.

The absence of an adequate definition of migratory workers as a class makes the writing of insurance on them, as such, difficult. They appear to include inside workers in such places as canning factories, as well as outside workers like pickers. They appear to include men, women, and children of all ages. They include factory workers who decide to shift, and pure itinerants. They include vacationing teachers and students. They encompass a group of persons of below-average income level, often living under subnormal living and health conditions, often with little or no general or health education, and at times of low moral standards. In this respect many migratory workers would appear to present a broad social problem requiring an approach at a deeper, more all-inclusive level than a health insurance mechanism could provide.

The experience of the nine insurance companies which at some time in the recent past had insured migratory workers serves to verify these opinions to some extent, although only one of these companies had had experience with American migratory workers. This company had written hospital insurance on migrants but because the experience was abnormally poor, resulting in a prohibitive cost for the insurance, the experiment had to be abandoned. One reason for the poor experience appeared to be that among the insured migrants, who often had neither a permanent address nor a stable home environment, illnesses or accidents which otherwise would be treated at home or on an outpatient basis had to be treated in the hospital. The result was an abnormally high rate of hospitalization.

Before going on to the experiences of the 17 insurance companies which presently have insured some migratory workers, it is of interest to summarize the comments of the eight companies which have attempted to or have affirmatively

considered writing protection on migrant workers. Six of these attempts concerned American workers. Five of the companies stated that they made proposals for insuring migrants on a group insurance basis but that the proposals were not accepted. One company, at the request of a hospital in one Eastern rural area, has been striving to conduct an experiment which would provide hospital insurance for migrants. To date, however, it has been unable to culminate the experiment due to an inability to overcome the administrative problems previously mentioned.

The following is the result of the investigation with respect to the 17 insurance companies that are presently insuring some migratory workers. Unfortunately, it was not possible to obtain sufficiently secure estimates of the numbers of these insured workers to relate any totals to the total estimated number of migrants in the United States. However, the responses as well as the varied experiences and approaches of these companies furnish some useful information. In certain instances their experiences appear to differ in some degree from the unfavorable experiences previously noted. Unfortunately, it was not possible to apply any common test to either the positives or the negatives. It is assumed that the existence of many variables makes the experiences to a certain extent noncomparable. These might include a difference between an individual policy approach and a group insurance approach, a difference in the nature of the insurance coverage, a difference between indoor workers and outdoor workers, and differences between those employed and added temporarily to a permanently insured group of workers and those insured separately.

Eight of the 17 companies are insuring American migratory workers. The circumstances are so varied that it is deemed of value to report the findings separately. One company insures American migrants in an Eastern Seaboard state. The insurance is on a weekly-premium industrial policy basis for which no special records are maintained. However, the company notes no unusual circumstances or experiences surrounding these persons. Another company also insures these workers on a weekly-premium basis. About 2,000 persons in the Southeast are insured for loss of income, the amount of benefit being $15 weekly for men, $5 for women, and $3 for children for a maximum of 20 weeks in any 12-month period or for any one disease or accident. There is also a hospital benefit equivalent to twice the loss of income benefit and there are accident benefits for death and dismemberment. The insurance is written on a noncancellable basis and the experience has been commensurate with that of other risks insured. The problem of persistency, to which reference has been made, has been marked, however, by a very high lapse rate.

A third company reports insuring American migratory workers on an individual policy basis. The coverage extends to dependents of the workers and includes any of the customary health insurance benefits which the company offers, provided the worker can qualify under the usual underwriting standards of the company. No unusual experience with this insurance is noted. Another company, which reports insuring American migrants on an individual annual policy basis for loss of time and hospitalization resulting from either sickness or accident, states that the experience is very poor, claims in relation to premiums running 36 per cent higher than the company average. The company states that it has found a great many instances of malingering among these people, and it is of the opinion that migrants cannot be underwritten without severe underwriter loss. Finally, one company reports insuring migrants on a monthly, quarterly, semiannual, or

annual basis for any of the coverages for which the worker can qualify. The company maintains no separate experience on these persons but notes the problems previously mentioned which cause some companies to consider these workers uninsurable.

One company yearly insures about 1,850 teachers and high school students as migrant workers in Connecticut. The insurance is required by the Connecticut State Welfare Board. The coverage is for blanket medical expense up to $500 resulting from either accident or illness and runs for a period of about three months. The contract is made with the growers and the premium is paid by the workers. The experience is barely satisfactory and each year the premium cost has had to be increased commensurate with rising medical costs.

The two remaining companies insure American migrants on a group basis. One provides coverage under the California Unemployment Compensation Disability Insurance Law for loss of time and hospital cost benefits as prescribed by the law. The coverage runs for a few months each year and no experience is noted. The other company writes hospital and surgical insurance, without maternity benefits, on a group insurance basis. About 1,000 migratory persons are presently covered and the insurance includes dependents. The coverage runs for about three months each year for the period of the canning season on the West Coast. The contract is made between the canner and the insurance company, with the employer paying the premium on his employees and the employees paying the premium on their dependents. Benefits are paid direct to the hospital, the doctor, or the employer but never to the employee. The company reports that claims are high and experience is poor but it continues the coverage because the migratory workers come under group insurance which it provides for permanent employees of the canneries.

Blue Cross-Blue Shield Experience

The experience of one statewide Blue Cross–Blue Shield plan which had two years' experience in 1953 and 1954 with American migratory workers was also reported. The workers were Texans of Mexican descent. The endeavor was an experiment which the plan considers not particularly successful. The coverage included the usual ward accommodation in the hospital and medical-surgical care with a $2,500 limit on coverage, with no waiting period or exclusion of pre-existing conditions, even for obstetrics. Benefits paid about equalled premiums collected, the latter being at the plan's customary group rates. This left nothing for expenses, which were unusually high in establishing the contacts necessary to attempt the experiment. In five groups 330 persons were protected under 93 contracts, averaging 3.5 persons per contract. In 1953, enrollment was on a monthly basis; in 1954 it was changed to a weekly basis.

The plan encountered three main difficulties. One was that it was never able to ascertain how many such workers were actually employed at any time, or the number of their dependents. This difficulty appears to have resulted from the method of hiring and paying the workers. Being paid on a piecework basis, the workers might leave the job at any time to go to work on another farm or just to go away. This situation, in turn, led to the second difficulty: On a considerable number of the farms, there was no method of deducting premiums from wages. The third difficulty appeared to be quite basic. Although everyone concerned expressed interest in the coverage and a desire to cooperate, cooperation did not in fact materialize. There were understandable reasons for

this. While the cooperation of the growers' association was necessary to stimulate interest among its members and to supervise enrollment and collections, the association did not have the necessary personnel to perform these functions. Personnel of the plan then tried to work with the growers directly. However, when the migrants arrive, the grower is at his busiest and cannot afford the time for these tasks. Attempts were then made to function through the processor. However, such occurrences as a late frost made it impossible to carry out the project.

The plan concluded after this experiment that lack of time on the part of the farmer-employer to tend to enrollment and servicing during his busiest season, together with the hiring and payment methods used, make insuring this type of migratory worker impossible. It concluded that the answer to the question of insuring migratory workers would have to be a strong central organization which could handle the enrollment and servicing of the migrant workers employed by its grower patrons.

Summary

The experiences reported here, in providing or attempting to provide health insurance for migratory workers, the successes and the failures, are so lacking in comparability as to be inconclusive. However, one conclusion is inescapable. The migratory worker presents a unique problem to an insuring mechanism. This problem has to be segmented by the different types of migratory workers and the types of work they perform. Insurance appears more feasible in some instances than in others. For example, those employed in canning or processing plants at the peak of the picking season, becoming part of a permanently employed group and probably working fixed hours for fixed wages, would seem to present a different problem from that presented by those working for a farmer on a piecework basis.

In any instance, the small degree of demand for health insurance by or for migrants, either on a group or individual policy basis, indicates the existence of a much more basic problem. The experiences mentioned shed some light on various facets of the subject which might merit further consideration by those concerned with the over-all welfare of the migrant worker. It appears that the provision of medical care and the payment for such care is only one segment of the problem of the migrant and certainly not the basic problem.

It can be concluded that private insurance can and does furnish a mechanism by which migrant workers of various types might be protected against the financial hazards resulting from accidents and sickness. However, there are many underlying factors in the existence of the migratory worker which are social and economic as well as physical and which, in turn, are in their nature beyond the proper sphere of a health insurance mechanism.

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Cooperative Perinatal Mortality Study

A voluntary agency—the Community Service Society—and the Departments of Health and Hospitals in New York City are cooperating in a two-year experiment to improve maternity care and prevent perinatal mortality. This is a family-centered project by which the society will supplement existing nursing services of the two city departments. Its team of public health nurses will serve both expectant mothers and the members of their families.

In the experiment two groups of mothers will be studied: one selected from women who had received care in the prenatal clinic of Metropolitan Hospital, the other of those admitted to the hospital without previous prenatal clinic care. Six months after delivery comparison will be made of the relative health status of patients and families in the two groups. In this way it is hoped to evaluate such influence on perinatal deaths as diet, adequacy of housing, hygiene, safety, size of family, education, cultural influence, quality of famly life, and physical and emotional health.

The importance of maintaining optimal fluoride levels in water supplies to prevent dental caries is emphasized in this article. It reports on a study of water samples collected in three cities to determine the constancy and adequacy of fluoride concentration.

EXPERIENCE IN MAINTAINING CONSTANT FLUORIDE CONCENTRATIONS

Grace C. Scholz Spitz, F.A.P.H.A.; Floyd B. Taylor, M.P.H., F.A.P.H.A.; and W. L. Harris

IT IS WELL established that optimal concentrations of fluoride in the drinking water will result in 65 per cent less dental caries experience when used from birth than would result from the use of fluoride-free water.[1, 2, 3] This knowledge has led to the widespread fluoridation of community water supplies. At present, some 32 million people in the United States use drinking water to which prescribed amounts of the fluoride ion have been added and 3 million more use water in which fluoride is naturally present in the optimal amount. It is also recognized that fluoride, when present in less than optimal amounts, at best provides less preventive benefit with regard to dental caries than it should.[4]

There is no doubt that fluoridation can be considered one of the major preventive health measures developed in the past few decades. The responsibility for bringing about wide-scale public acceptance of the fluoridation procedure rests with dentists, engineers, and other specialists whose role it is to effect and influence action in state and local health departments. That the responsibility in large measure has been accepted is evidenced by the extent to which fluoridation has been adopted. An impressive number of communities have instituted the procedure and a sizeable segment of the population is served fluoridated water; these are misleading measures of progress, however, if the procedure in some communities fails to provide fluoride in the proper amounts.

State health departments prescribe the level or range of levels of fluoride content to be maintained in community water supplies and, in many states, specify also the maximum permissible content that must not in any instance be exceeded. They provide for the chemical analysis of community water supplies, sometimes at frequent intervals in communities just beginning fluoridation, and on a regular basis at all times for the purpose of safeguarding the public health.

From the public health dentist's point of view, it is obviously equally important that the level of the fluoride content not decline below the point at which maximum benefits will be derived. This paper discusses the actual experience of three communities in respect to the pre-

cision with which they have maintained fluoride content levels as related to their objectives.

The Water Supply Systems

The water supply system of Grand Rapids, Mich., the first community to be discussed, serves a population of about 200,000. The water plant is divided into two operating divisions requiring a fluoride feeder for each half. Gravimetric-type dry feeders are used. The plant operates as a conventional rapid sand unit, with Lake Michigan as the raw water source. Sodium fluoride is added to the water as it passes from settling basins to filters. There are no measuring devices to indicate the flow of water from the settling basins, and as a consequence the operator determines his fluoride dosage on the basis of raw water venturi readings. This arrangement requires that settling basin levels be maintained at a fairly constant figure.

City A, a town in an eastern state and the water supplier for 35,000 people, is the second community to be considered. This city, which no longer is fluoridating, derives its supply from a surface source and from several wells, each of which was equipped with its own fluoridator. At the major source, an impoundment of a small stream, sodium fluoride was added by a volumetric dry feeder in a gravity system of application. The other sources of supply are isolated wells, one of which had the same type of feeder with an auxiliary centrifugal pump to force the fluoride solution into the discharge line of the pump. At the other wells, solution-type feeuers applied sodium fluoride solution to pump discharge lines.

City B, the third community for which findings are presented, is also located in the East. Its water supply system serves 12,000 people. It obtains its water from a series of wells which discharge into an open circular concrete basin. During times of peak demand, there is discharged into the reservoir an additional well-water line from a private water purveyor. A large suction line conveys water from the reservoir to a pair of centrifugal pumps. Saturated sodium fluoride solution is fed by means of a diaphragm-type pump into the suction line.

Method

Water samples were collected at frequent intervals and from several points in the water plants and distribution systems of the three cities under discussion for the purpose of verifying the accuracy of the procedures employed. Chemical analyses of water samples established the fluoride content.

Analysis of water samples was made: in Grand Rapids, by the water department chemist, verified in part by the Michigan State Department of Health; in City A, by the water department chemist-bacteriologist; in City B, by a chemist consultant to the water purveyor. In each instance, a Standard Methods colorimetric test was used. It may be assumed that errors in the readings of the various investigators will be of the same order of magnitude and that they are not sufficiently sizeable to introduce bias into the findings.

The resulting data were collected as part of normal record-keeping during the course of operation of the water plants. This presentation takes advantage of their availability. Approval of their use for this purpose has been obtained.

The findings were arranged in a series of frequency distributions; means and standard deviations were computed for each. These data were used to measure how accurately each system achieved its stated objective of maintaining a fluoride concentration of about 1 ppm.

Table 1—Fluoride Concentrations Determined from Analysis of Clear-Well Water Samples Collected in the Grand Rapids, Mich., Water Plant, 1945–1954

Fluoride Ion Content (in ppm)	1945–54 Samples		1953–54 Samples		1951–52 Samples		1949–50 Samples		1947–48 Samples		1945–46 Samples	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
0.6	1	.0	0	—	0	—	0	—	0	—	1	.1
0.7	1	.0	1	.2	0	—	0	—	0	—	0	—
0.8	4	.1	0	—	0	—	0	—	1	.2	3	.5
0.9	115	4.2	6	1.2	9	1.8	10	2.0	23	3.9	67	9.5
1.0	1,947	69.8	246	48.6	304	60.1	362	72.7	497	85.4	538	76.4
1.1	671	24.0	251	49.6	182	36.0	98	19.7	55	9.4	85	12.1
1.2	51	1.8	2	.4	11	2.1	26	5.2	4	.7	8	1.2
1.3	2	.1	0	—	0	—	1	.2	0	—	1	.1
1.4	0	—	0	—	0	—	0	—	0	—	0	—
1.5	0	—	0	—	0	—	0	—	0	—	0	—
1.6	0	—	0	—	0	—	0	—	0	—	0	—
1.7	1	.0	0	—	0	—	0	—	0	—	1	.1
1.8	0	—	0	—	0	—	0	—	0	—	0	—
1.9	1	.0	0	—	0	—	1	.2	0	—	0	—
2.0	0	—	0	—	0	—	0	—	0	—	0	—
2.1	1	.0	0	—	0	—	0	—	1	.2	0	—
2.2	0	—	0	—	0	—	0	—	0	—	0	—
2.3	0	—	0	—	0	—	0	—	0	—	0	—
2.4	1	.0	0	—	0	—	0	—	1	.2	0	—
Total	2,796	100.0	506	100.0	506	100.0	498	100.0	582	100.0	704	100.0
Mean		1.07		1.09		1.08		1.08		1.06		1.05
Standard deviation		.06		.05		.10		.07		.08		.06

Results

The amount of fluoride applied in the Grand Rapids water plant is contingent on the amount of natural fluoride present in Lake Michigan, its source of raw water. The objective is to maintain an average between 1.0 and 1.1 parts of fluoride in one million parts of water by adding 1.0 ppm fluoride to the lake water, supplementing the natural fluoride content of the lake, known to range generally from 0.04 to 0.08 ppm in fluoride content.

Table 1 and Figure 1 show the frequency distribution, the mean, and standard deviation of 2,796 clear-well samples read in Grand Rapids during the years 1945–1954. The mean fluoride content of these samples for this 10-year period was 1.07 ppm—well within the range of the objective 1.0 to 1.1 ppm. The standard deviation was 0.06 ppm, indicating that 95 per cent of the readings ranged from 0.95 to 1.19 ppm fluoride and showing remarkable precision in achieving the desired fluoride content.

To demonstrate that deviations from the mean during this 10-year period are comparable for shorter time intervals, Table 1 and Figure 1 also list frequency distributions, means, and standard deviations of the clear-well samples for the five two-year periods between 1945 and 1954. During each of these biennial periods, the mean of the readings was close to the mean for the entire period

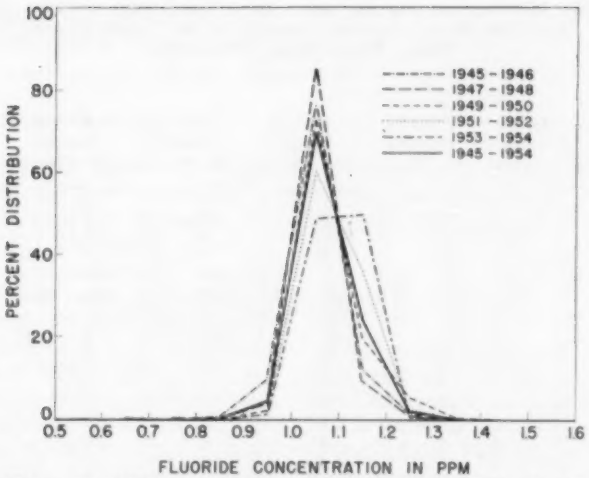

Figure 1—2,796 Water Samples from Clear Well in Grand Rapids, Mich.

and the standard deviation was comparable to that of the summary findings for the total group. The five means ranged from 1.05 to 1.09 ppm, with standard deviations of 0.04 to 0.10.

In the course of this same 10-year period 5,386 water samples were drawn for varying lengths of time at 11 points in the Grand Rapids distribution system. The mean readings for fluoride content of water collected at these specified sites ranged from a low of 1.04 ppm to a high of 1.12 ppm, with standard deviations that ranged from 0.03 to 0.10, making these findings quite comparable with those obtained from clear-well readings.

It is apparent that fluoride-content determinations in the water plant yielded data quite comparable to those obtained from the analysis of distribution system findings during the same time period.

Table 2 and Figure 2 present findings for 346 samples collected during the period January, 1950–April, 1952, from 15 distribution-system taps in City A. The objective was to add 1.0 ppm fluoride to the water supply. Only 29 of the 346 samples contained as much as 1.0 ppm fluoride. The mean amount of

Table 2—Fluoride Concentrations Determined from Analysis of Water Samples Collected from 15 Distribution-System Taps in City A, January, 1950 to April, 1952

Fluoride Ion Content (in ppm)	Samples	
	Number	Per cent
0.0	6	1.7
0.1	1	.3
0.2	6	1.7
0.3	18	5.2
0.4	35	10.1
0.5	74	21.4
0.6	61	17.6
0.7	55	15.9
0.8	35	10.1
0.9	26	7.5
1.0	22	6.4
1.1	3	.9
1.2	1	.3
1.3	0	—
1.4	3	.9
Total	346	100.0
Mean	0.62	
Standard deviation	0.23	

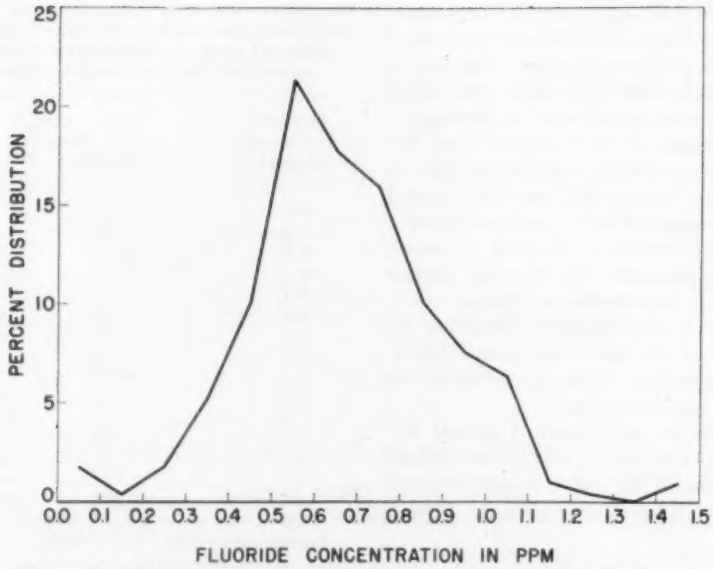

Figure 2—Water Samples from 15 Distribution-System Taps in City A, January, 1950–April, 1952

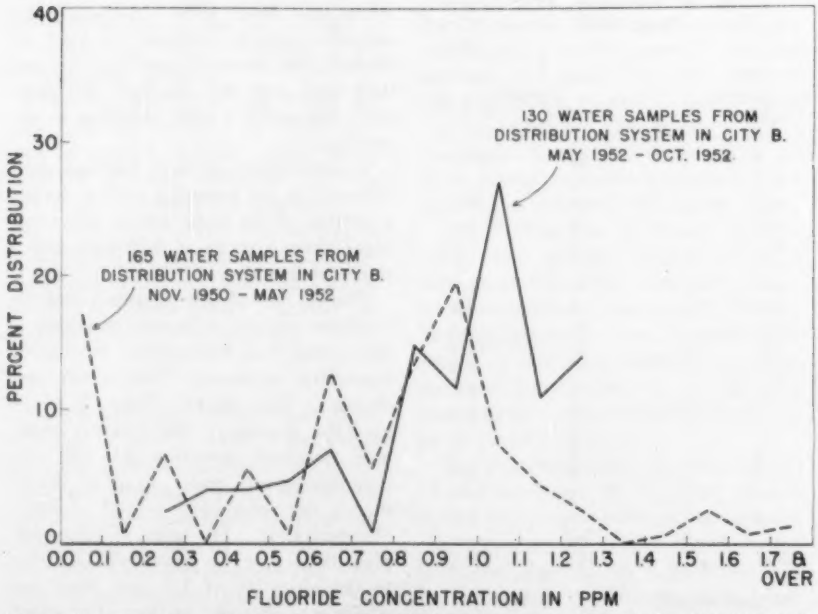
PERCENT DISTRIBUTION
40
30
20
10
0
130 WATER SAMPLES FROM DISTRIBUTION SYSTEM IN CITY B. MAY 1952 - OCT. 1952
165 WATER SAMPLES FROM DISTRIBUTION SYSTEM IN CITY B. NOV. 1950 - MAY 1952
0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 & OVER
FLUORIDE CONCENTRATION IN PPM

Figure 3—Water Samples from the Distribution System in City B, Specified Periods

fluoride, 0.62 ppm, found in the samples falls far short of the amount required to provide optimum benefits. The size of the standard deviation, 0.23 ppm, points up the wide variation in the readings.

Readings of 316 samples from the four water supply sources in City A collected during the same time period gave a mean of 0.59 ppm fluoride and a standard deviation of 0.36 — which closely parallels the fluoride content found in the distribution system.

City A has ceased to fluoridate by action of the governing council following suspension of the procedure by the water superintendent.

Table 3a and Figure 3 present frequency distribution, mean, and standard deviation of 165 water samples collected in the distribution system of City B during the period between November, 1950, and May, 1952. Although the objective was to provide 1.0 ppm of fluoride, the mean of these samples was 0.66 ppm and the standard deviation 0.41, indicating a wide variation in the readings.

Table 3a—Fluoride Concentrations Determined from Analysis of Water Samples Collected from the Distribution System in City B, November, 1950 to May, 1952

Fluoride Ion Content (in ppm)	Samples Number	Per cent
0.0	28	17.0
0.1	1	.6
0.2	11	6.7
0.3	0	—
0.4	9	5.5
0.5	1	.6
0.6	21	12.7
0.7	9	5.5
0.8	22	13.3
0.9	32	19.4
1.0	12	7.3
1.1	7	4.2
1.2	4	2.4
1.3	0	—
1.4	1	.6
1.5	4	2.4
1.6	1	.6
1.6+	2	1.2
Total	165	100.0
Mean	0.66	
Standard deviation	0.41	

Table 3b—Fluoride Concentrations Determined from Analysis of Water Samples Collected from the Distribution System in City B, May to October, 1952

Fluoride Ion Content (in ppm)	Samples Number	Per cent
0.0	0	—
0.1	0	—
0.2	3	2.3
0.3	5	3.9
0.4	5	3.9
0.5	6	4.6
0.6	9	6.9
0.7	1	.8
0.8	19	14.6
0.9	15	11.5
1.0	35	26.9
1.1	14	10.8
1.2	18	13.8
Total	130	100.0
Mean	0.88	
Standard deviation	0.26	

In verification of these findings, data collected at the pumping station during a portion of the same period (86 readings) show a mean of 0.76 ppm and a standard deviation of 0.32.

The officials of City B, aware that the resultant amount of fluoride provided in the system was inadequate, introduced corrective measures. The results are shown in Table 3b and Figure 3, which give the frequency distribution, mean, and standard deviation of 130 distribution-system water samples drawn during the subsequent period of May–October, 1952. The mean of these samples, 0.88 ppm, is considerably closer to the objective of 1.0 ppm than that which was obtained earlier. The stand-

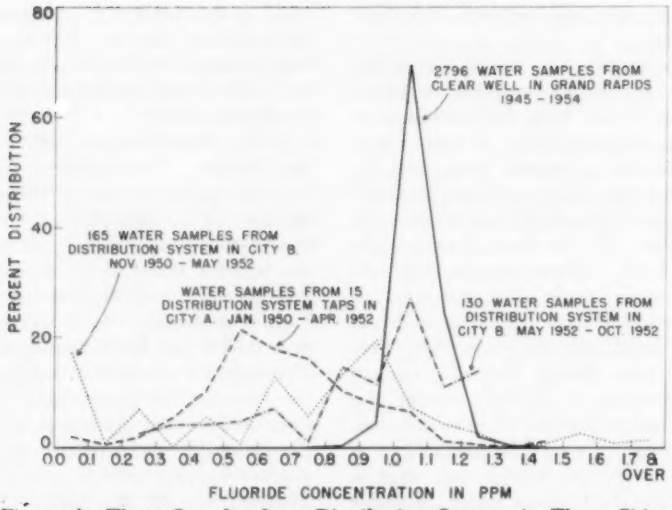
80
60
40
20
0
PERCENT DISTRIBUTION
2796 WATER SAMPLES FROM CLEAR WELL IN GRAND RAPIDS 1945 - 1954
165 WATER SAMPLES FROM DISTRIBUTION SYSTEM IN CITY B NOV. 1950 - MAY 1952
WATER SAMPLES FROM 15 DISTRIBUTION SYSTEM TAPS IN CITY A JAN. 1950 - APR. 1952
130 WATER SAMPLES FROM DISTRIBUTION SYSTEM IN CITY B MAY 1952 - OCT. 1952
0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 & OVER
FLUORIDE CONCENTRATION IN PPM

Figure 4—Water Samples from Distribution Systems in Three Cities, Specified Periods

ard deviation of the mean, 0.26 ppm, is still quite large but demonstrates a greater tendency of the daily readings to cluster than those collected in the preceding time interval.

While fluoridation in City B had not quite achieved the level at which optimum protection against tooth decay would be afforded, there had been a marked improvement in procedure.

For ready comparison, Figure 4 gives the frequency distributions of the samples drawn in Grand Rapids, in City A, and in City B both before and after the adoption of corrective measures.

Discussion

Three water supply systems have been discussed, in each of which a somewhat different procedure for application of the fluoridation process is used. While any given procedure may present unique engineering difficulties, one problem which these three have in common, and with which the operators of each of the 800 water supply systems now fluoridating are confronted, is the consistent maintenance of a selected fluoride level. Earlier studies have demonstrated that water-borne fluorides, present in optimal amounts and used from birth, are an effective means by which dental caries can be reduced. The extent to which protection is afforded, however, is entirely dependent on the maintenance of a constant level of optimal fluoride content.

The fluoridation procedure presents no unusual technical difficulties but it does require that the water plant operator demonstrate the same careful practice he is accustomed to exercise in the application of any water treatment process. Accurate fluoride feeding may in some instances be a difficult task but it is never an impossible one.

Ten years' experience in Grand Rapids and in Newburgh, N. Y.,[5] have demonstrated the practicability of maintaining constant, optimal fluoride levels in the controlled fluoridation procedure. The experience in City B shows clearly, too, that improvement is possible when the

deficiency is recognized and correction is sought.

Unfortunately City A and City B are not unique as communities in which fluoridation has been functioning on a less than adequate basis. It may be that some benefit is derived from fluoridation even when the procedure is inadequately maintained; if there is, however, it certainly falls far short of what might be achieved. Dental examinations will reveal some years after the start of fluoridation whether reductions in dental caries prevalence are less than they should have been.[6] Periodic current determinations of fluoride content and immediate correction of observed deficiencies can prevent this eventuality. A casual review of fluoride test data is insufficient basis upon which to judge the true trend of the results of the fluoridation procedure. An analysis, by simple statistical methods, of series of test results, preferably at intervals not exceeding three months, is needed to determine the true picture.

State health departments frequently establish a maximum fluoride concentration never to be exceeded. Perhaps it is too readily assumed that the job has been satisfactorily done if this condition is met in any given analysis of a water sample. Recommended levels of fluoride concentration are also established in many states, but no great concern is evidenced when fluoride concentrations are found below the lowest recommended level. Just as it is clearly the obligation of those concerned with water fluoridation to see that the levels do not exceed maximal standards, so it is their obligation to maintain optimal standards.

The health department engineer bears the major direct responsibility for surveillance of the controlled fluoridation process. He is closest to the waterworks operator and usually has the latter's confidence. The engineer is therefore in an excellent position to follow the trend of fluoridation from his own and the operators' reports. It is his duty to note serious deviations from proper practice and to make recommendations for corrective action.

A less direct responsibility lies with the dentist. Unfortunately, however, from the point of view of the public—the user of fluoridated water—it is the dentist who has predicted and promised the benefits that can be derived from fluoridation. It is he who has assured them that children's teeth will be better preserved if they drink fluoridated water. The dentist's subsequent indifference to the necessity for maintaining a precise fluoride level and his failure to exercise the necessary vigilance through proper engineering channels can only bring him discredit should fluoridation be condemned because inadequate procedure has produced inadequate results.

The situation is only made worse because the results are not immediately measurable. The time lag between application of the procedure and determination of its effect means that the damage is done before it can be rectified. It will be too late to prevent the inevitable recriminations five or ten years from now should it become evident then, by measurement of dental caries prevalence levels, that adequate fluoride concentrations have not been maintained.

In the last analysis, fluoridation as a public health measure will not be judged by the maximum results that a properly conducted study procedure can effect. It will be judged by its actual achievement in preventing dental caries in all communities of all states where it is practiced. Can we be assured that the predictions of the dentists of today will stand the time-lag test? Today's predictions will meet future public scrutiny only if the engineers and the dentists of today suit the action to the word and make certain that what is so eagerly preached is also meticulously practiced.

Summary

1. Water samples collected in three cities for varying time intervals have been analyzed to determine constancy and adequacy of the fluoride levels that were maintained.

2. Constancy of fluoride readings at the optimal level with a small standard deviation has been demonstrated in one city, Grand Rapids, Mich.

3. Average fluoride content in City A fell far short of the objective and demonstrated a large standard deviation in the daily readings during the time period for which data were collected.

4. Average fluoride content in City B fell short of the objective during the initial test period and showed wide variation during this interval. During a succeeding test period in which efforts for improved controls were attempted, the average fluoride content more nearly approximated the objective and individual readings demonstrated much less variability.

5. It is apparent that maximal benefits in dental caries prevention will not be achieved unless optimal fluoride concentration is maintained. Mindful awareness of any failure to maintain this objective should prompt immediate correction of a deficient application of the technic. Delay until it is evident that anticipated reductions in dental caries prevalence levels have not been achieved can only bring undeserved discredit to one of the principal public health measures of this era.

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Mrs. Spitz is chief of statistical services, Division of Dental Public Health, Public Health Service, Washington, D. C. Mr. Taylor is sanitary engineer director of the Division of Sanitary Engineering Services, Public Health Service, Washington, D. C. Mr. Harris is water plant supervisor of the Department of Municipal Water and Light at Grand Rapids, Mich.

This paper was presented before the Dental Health Section of the American Public Health Association at the Eighty-Fifth Annual Meeting in Cleveland, Ohio, November 14, 1957.

American Board of Nutrition Examinations

The American Board of Nutrition will hold the next examinations for certification as a specialist in human nutrition during the week of April 12–18, 1959, in Atlantic City, N. J. Candidates who wish to be considered should forward applications to the secretary's office not later than March 1. Application forms may be obtained from the secretary, Dr. Robert E. Shank, Department of Preventive Medicine, Washington University School of Medicine, Euclid and Kingshighway, St. Louis, Mo.

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Journal of Public Health

EDITORIALS

Pennsylvania Attacks an Old Problem

A COMPREHENSIVE STUDY of silicosis in Pennsylvania, carried out by the U. S. Public Health Service, was published in 1934. A similar study of bituminous coal mines appeared in 1941. Both studies made highly pertinent recommendations, such as the need for continuing dust studies, chest x-ray programs, and preventive medical supervision of coal miners. Many countries accepted these recommendations and put them into effect. In the United States, however, they were apparently lost to sight in the struggle between management and labor.

Victoria Trasko, in a study covering a five-year period, found that there were 10,367 cases of silicosis compensated in 22 states.* Recently an analysis of death certificates in Pennsylvania revealed that chest disease of occupational origin appeared on 1,557 certificates. This was reported as the principal cause on 979 certificates and as the contributory cause on 578. Approximately 90 per cent of these cases were coal miners.

The attention of the Pennsylvania Health Department was also drawn to the fact that payments totaling one million dollars a month are being made at present under the Commonwealth's workmen's compensation plan. These payments are made to more than 5,000 coal miners totally disabled by silicosis, or to survivors of miners who died from silicosis, or from heart disease or tuberculosis brought on by silicosis. In addition, there are many miners at work who may be suffering from the early stages of the disease.

Recognizing the economic and social importance of the problem, Pennsylvania has initiated a campaign against silicosis among miners. The silicosis control program is the outcome of a series of meetings during the past year between a number of agencies and groups concerned with the problem. Representatives of the United Mine Workers of America, of the mining industry, the Pennsylvania Medical Society, the Federal Bureau of Mines, the Public Health Service, and the Departments of Health, Mines and Mineral Industries, and Labor and Industry met in joint sessions to review the silicosis question. Under the direction of Dr. C. L. Wilbar, Jr., secretary of health, the State Health Department and its Division of Occupational Health have developed extensive plans to attack the problem. The campaign will proceed along two major lines. The first is intended to determine the amount of dust exposure in coal mines, and dust studies have been initiated by the department for the first time since 1934. The second line of attack involves chest x-rays and lung-function tests. An ambitious examination program has been

planned and will be initiated shortly. The first mines to be surveyed, both as to dust exposure and the physical condition of the miners, will be those employing 50 or more persons. There are 115 anthracite and 113 bituminous coal mines in this category.

Problems such as silicosis involve a variety of groups and interests and the Pennsylvania surveyors will no doubt encounter difficulties and resistances. Nonetheless, this is an important undertaking and potentially of great value. It is to be hoped that the example set by Pennsylvania will be watched and perhaps followed elsewhere in the United States.

* Trasko, Victoria. Some Facts on the Prevalence of Silicosis in the United States. Arch. Indust. Health 14:379–386, 1956.

The Epidemiologist on Some World Issues

SEVERAL MOMENTOUS issues of the day that fall naturally within the epidemiologist's area of competence are going to others by default, especially those problems which involve the health of more than one generation of human beings. This is said in no spirit of pique, but because it is of major importance for society to reach correct conclusions and to take appropriate action in at least three such areas.

Foremost is the matter of the definitions and pronouncements on radiation hazards that have been given wide publicity without adequate attention to even primer principles of epidemiology. For example, how was the maximum permissible limit of 10 roentgens per person up to the age of 30 arrived at? According to the Scientific American, a cumulative total up to the age of 30 of 10 million roentgens for every million persons was "proposed" as tolerable. The next step seems to have been to divide 10 million by one million to compute the average permissible dose per person under 30. What persons composed the hypothetical population of 10 million under the age of 30 and how they were arranged in time and space was not specified. Instead, it is stated that the factor of community dosage involves a linear relationship between the size of the dose and the elicited responses. The assumption is that this linear relationship applies equally to populations, to the individuals who make up these populations, and to the gonads of those persons containing the next generation. Furthermore, we are told that no exposure to nuclear energy is so small as to have no effect and that successive exposures are additive in their effects. The consequences of these exposures are specified as leukemia, bone tumors, congenital malformations, premature aging, and mutations.

During the last decade all of these, as well as other interwoven facts, principles, assumptions, speculations, and conclusions have been presented to the public almost as if they formed a fabric of provable doctrine and confirmed data. Meanwhile, it has taken several years to complete a few epidemiologic studies of radiation and leukemia, of mortality trends from leukemia, of radiation and premature aging as measured by deaths of roentgenologists, and to examine the linear theory of carcinogenesis. Results are at odds with such assertions as have been mentioned. Moreover, ten years spent studying the genesis of congenital malformations by experimental, clinical, and epidemiological methods have produced no evidence that a race of sports and monsters is likely to be the price of the utilization of nuclear energy.

However, the purpose of this comment is not to vindicate particular views or to take the negative in a debate as to whether or not 15,000 people may die of cancer as the consequence of strontium 90 released by the explosion of a large hydrogen bomb at Bikini in 1954. The

purpose is to emphasize that epidemiologists are not sufficiently identified in the public mind as spokesmen about environmental problems that may concern the health of future generations. For example, estimates have been made that a million "seriously defective children" and "two million embryonic deaths" will result from fall-out to date. The strength of such statements—they are almost slogans—seems to depend on the magnitude of the number of defective children and dead embryos chosen. A million is a more impressive number than a thousand, and two million even more so. Yet such categories as "seriously defective children" and "increased mutation rates" are so vague that numerical estimates cannot be checked and an unreasoned terror is left in the wake of an assertion, like the curse of Pharaoh's tomb, that cannot be countered reasonably.

The need is for application of established principles of epidemiology as well as those of physics, engineering, and genetics.

The second health problem that has to do with generations yet unborn is that of acquired congenital malformations. Although a relative newcomer to organized public health, the newcomer is surely here to stay. Few would deny that the application of epidemiologic principles is essential to an improved understanding of occurrence and control. Although the indicated approach clearly involves a team effort of many specialists, it is the epidemiologist, who often seems to be missing when the line up is announced. Easily overlooked is the simple, blunt fact that sheer weight of clinical detail and numbers of cases can not compensate for deficiencies of planning for the data being processed. Nor can Univac refine sense out of a mass of nonsense.

A third problem of future generations is a concern today of most thoughtful persons. Perhaps it should be of particular concern to epidemiologists for they bear at least some of the responsibility for its acuteness through the very success of their efforts against communicable diseases. An old acquaintance, the "population problem" has haunted mankind since the early formulations of Malthus. Today, however, we look about on all sides to see the exploding metropolis as a reality rather than an abstraction and how to arrive at an ecologic equilibrium looms as the number one public health problem of the future.

Not only do the problems of the prenatal area of health stand in need of contributions from epidemiology, but within the American Public Health Association the subject should receive serious attention from the appropriate program area committees. There is undoubtedly an overlapping of interests and competence for judgments and actions, actions which need to be sober, unemotional and correct.

(The Journal is indebted to Theodore H. Ingalls, M.D., F.A.P.H.A., professor of preventive medicine and epidemiology, University of Pennsylvania School of Medicine, Philadelphia, Pa., for preparing the above editorial. It is based on remarks presented by Dr. Ingalls as chairman of the Section on Epidemiology at the Section luncheon, Eighty-Sixth Annual Meeting of the American Public Health Association, October 29, 1958, St. Louis, Mo.).

Two Fifty-Year Birthdays

A BIRTHDAY CELEBRATION of an organization, particularly the fiftieth, may be just the time to look at the past with profit, and at the future with anticipation. At St. Louis, the Statistics Section took account of what had happened since it was founded in 1908. The review was conducted by Carl L. Erhardt, director of the Bureau of Records and Statistics, New York City Department of Health. His account of vital statistics then and now will appear in an early issue of the Journal; but it is evident that the first

fifty years have established the statistician as a full-fledged member of the public health team. This membership has been a productive one, and public health statisticians can look forward to an exciting, challenging future. In concert with their colleagues in other disciplines, they will muster their knowledge and experience to help delineate and guide the public health programs of tomorrow. We salute the Statistics Section on the occasion of its fiftieth birthday. May its second fifty years be even more fruitful and productive.

Nor can we omit mention of the fiftieth anniversary of the Health Officers Section. Not only is it the largest section in the American Public Health Association, but also one comprising an extremely important group of health workers. In the last analysis, it is the responsibility of the health officer to see to it that the health problems of the community receive proper and effective attention. The past fifty years show the consequences of effective public health administration. The next fifty years will undoubtedly be faced by the Health Officers in the same spirit of devotion and accomplishment.

National Science Fellowships

The National Science Foundation calls attention to two fellowship programs through which it will make some 1,200 awards in March, 1959, for the 1959–1960 academic year. These are awarded in the mathematical, physical, medical, biological, engineering, and social sciences. For the predoctoral fellowships, stipends are $1,800 the first year, $2,000 the second, and $2,200 the terminal year, with additional allowance for tuition and fees, and dependents. The final date for application is January 5, 1959.

The postdoctoral fellowship annual stipends are $4,500 also with the same additional allowances as for predoctoral. The final application date is December 22, 1958.

In each case information and application materials from Fellowship Office, National Academy of Sciences—National Research Council, 2101 Constitution Avenue, N.W., Washington 25, D. C.

THE ALBERT LASKER AWARDS FOR 1958

Nineteen hundred and fifty-eight marks the 13th annual presentation of the Albert Lasker Awards by the American Public Health Association. The Lasker Awards are given by the Albert and Mary Lasker Foundation to individuals and groups for outstanding contributions in research related to diseases which are the main causes of death and disability and for distinguished service in the field of public health administration.

The Awards were conceived not only to honor the recipients and to dramatize their accomplishments, but also to arouse increased professional and public interest in medical research and public health administration and to aid in the rapid dissemination of vital new health information to the peoples of the earth.

In the 12 years since their founding the Albert Lasker Awards of the American Public Health Association have come to be regarded among the nation's primary medical honors. Ten of the winners have later received Nobel Prizes.

The following citations were presented to the recipients at the Second General Session of the Association's Annual Meeting in St. Louis, Mo., on October 30, 1958. Each recipient received a statuette of the Winged Victory of Samothrace, together with a beautiful leather-bound, illuminated citation. Winners received checks for $2,500.

Herman E. Hilleboe, M.D., commissioner, State Department of Health, Albany, N. Y., and chairman of the Awards Committee, assisted by Roy J. Morton, C.E., President, American Public Health Association, presented the citations, which follow:

AWARD IN PUBLIC HEALTH ADMINISTRATION

Basil O'Connor

BASIL O'CONNOR. Probably more than any other layman of modern times, Mr. Basil O'Connor has contributed significantly to the substantial conquest throughout the world of a major disease of childhood, paralytic poliomyelitis. Since the introduction of the Salk vaccine, the incidence of polio in the United States has declined 86 per cent, from an annual average of 38,700 cases in the prevaccine years 1950–1954 to only 5,500 in 1957. Although we are prone to think of him as president of the National Foundation for Infantile Paralysis, it must be remembered that he has served also with distinction as president of two other organizations—the American National Red Cross and the National Health Council.

As a dynamic humanitarian, he has left his imprint on the fields of education, social service, and public health. Perhaps outstanding is the unprecedented impact on the solution of a disease problem which he achieved through the effective nation-wide mobilization of volunteer health workers. A large part of this impact was the result of his courageous insistence on emphasizing basic research, where additional personal services to the afflicted would have been easier and more readily accepted. In all his endeavors he has supported the three fundamental steps in any progressive social program: experimentation, application and evaluation.

Under Mr. O'Connor's leadership the National Foundation for Infantile Paralysis has offered a pace-setting example of a volunteer organization with strong "grassroots" support at the local level resulting from firm national leadership utilizing the highest professional skills available on a world-wide basis. One of the interesting technical contributions resulting from this organization's administrative experience has been the integration of administrative costs into research grants.

All of these contributions, in addition to the

tens of thousands of children whose lives will be happier because of the conquest of paralytic poliomyelitis, represent cogent reasons for welcoming Mr. O'Connor to the distinguished ranks of earlier Albert Lasker Award recipients.

AWARD IN MEDICAL RESEARCH

Robert W. Wilkins, M.D.

ROBERT W. WILKINS, M.D. The past decade has seen more progress against the vast problem of hypertension than all previous history. Today, literally millions of victims of this long-term illness have had their suffering alleviated and their lives extended because of new knowledge gained through medical research and widely applied by physicians. Dr. Wilkins has played a most significant role in these advances.

Dr. Wilkins was the first physician in the Western World to employ the ancient Indian snakeroot, rauwolfia, and its derivative, reserpine, in the treatment of high blood pressure. His work with this drug and with combinations of reserpine and other medications did much to establish their appropriate use and resulted in the uncovering of other knowledge concerning hypertension.

More recently, Dr. Wilkins has made another outstanding contribution through his investigations showing that the new diuretic drug, chlorothiazide, often is particularly effective in cases of hypertension which have resisted other forms of treatment and, because of its diuretic action, in arterial hypertension complicated by a failing heart and edema.

Dr. Wilkins also has postulated that, while other drugs now used for their hypotensive effects will lower blood pressure in both normal persons and hypertensive ones, chlorothiazide reduces the pressure only in hypertensives. This property may help explain the riddle of why some people become hypertensive while others do not.

Dr. Wilkins's contributions distinguish him as truly a great scientist, teacher, and physician as he takes his place among the eminent ranks of those honored by the American Public Health Association through the Albert Lasker Awards.

AWARD IN MEDICAL RESEARCH

Peyton Rous, M.D.

PEYTON ROUS, M.D. Our modern knowledge of the cancer process has been constructed to a large extent around the major contributions of Peyton Rous. His original demonstration of the cell-free transmission of fowl neoplasms was complete and at the same time revolutionary. A storm center of discussion among workers in cancer research for 40 years, its significance for an understanding of cancer has been fully appreciated only recently. This work remains a landmark not only in the field of its direct application, cancer research, but also in virology as a whole.

With similar skill, Peyton Rous helped to create modern hematology. Thirty years ago, the mechanisms of blood generation and destruction were prime medical mysteries. The studies of Dr. Rous and his colleagues helped transform blood transfusion from a major surgical undertaking to a routine technic. His findings made possible also the first blood banks for preserving and storing this life fluid. Additionally, his studies led physicians to a new understanding of how to treat the problem of anemia, as well as to new insight into the source and formation of antibodies in the blood.

Dr. Rous's later work revealed the carcinogenic effect of hydrocarbons, virus-induction of mammalian cancer, and complementary actions of carcinogens and viruses in cancer development. This work underlies the research concept that hidden or latent viruses may spring into action under apparently unrelated stimuli and trigger off cancer in human beings.

With this Albert Lasker Award, the American Public Health Association honors the remarkable productivity of a tireless researcher in the service of mankind, Peyton Rous.

AWARD IN MEDICAL RESEARCH

Theodore Puck, Ph.D.

THEODORE PUCK, PH.D. Biologists have long sought a means for studying the descendants of single mammalian cells. The highly original and imaginative investigations of Theodore Puck have now made possible the cultivation of single mammalian cells.

Through his ingenious culture technics these cells can now be grown in "pure" colonies—from nearly any organ including normal and cancerous, adult and newborn tissue.

Since each cell in the colony is an "identical twin" of the single parent cell, this permits consistent, quantitative studies on individual mammalian cells for the first time. In these cells, heritable differences are found to remain stable through innumerable successive generations.

This advance promises to be as significant as the development of methods for growing bacteria in pure culture. A new research tool has been created for cellular research on the effects of carcinogens and other chemical agents, on the effects of foods and vitamins, the processes of growth and aging, and on the effects of the physical environment.

Dr. Puck has found with his pioneering that the single-cell technics were used to demonstrate that mammalian cells can carry in latent form a virus ordinarily destructive to those cells. He has also found that high-strength radiation greatly increases the frequency of mutation and that the genetic apparatus may suffer radiobiologic damage from a dose as low as 96 roentgens.

Trained initially as a physical chemist, Doctor Puck has brought to his extensive studies of biological phenomena a point of view untrammelled by orthodoxy, a rigor in scientific method and incisiveness in reasoning which have placed him in the forefront of students of the mammalian cell.

The American Public Health Association is proud to present this Lasker Award to Doctor Puck in honor of his outstanding achievements.

SPECIAL JOINT AWARD IN MEDICAL RESEARCH

Alfred D. Hershey, Ph.D.

Gerhard Schramm, Ph.D.

Heinz Fraenkel-Conrat, M.D., Ph.D.

ALFRED D. HERSHEY, GERHARD SCHRAMM, and HEINZ FRAENKEL-CONRAT are responsible for a discovery that may be as important to biology and medicine as was the discovery of radioactivity to physics. Working with viruses in different parts of the world, these three scientists have demonstrated that a single chemical substance is the chief determinant of heredity in living matter. This genetic substance is nucleic acid.

It was Dr. Hershey in 1952 who provided evidence that the genetic factor of a bacterial virus consists of deoxyribose nucleic acid. In 1955, Dr. Schramm, in Germany, and Dr. Fraenkel-Conrat in the United States independently isolated the ribose nucleic acid component of a plant virus. Their laboratory experiments proved that this nucleic acid could enter plant host cells and could generate identical new virus particles.

The discovery of infectious nucleic acid provides a new approach to the basic nature of reproduction of living things, to the problems of mutation, and even to the transformation of a normal cell into a cancer cell.

Because nucleic acid is responsible for the transfer from parent to offspring of information concerning the form and substance of all life on earth its study makes possible a whole new field of research activity. This research also offers significant approaches to a direct attack on virus diseases and to a better understanding of virus activity.

To Alfred Hershey, Gerhard Schramm, and Heinz Fraenkel-Conrat, who had the vision to see that virus nucleic acid might be the germinal substance and the imagination to devise decisive experiments to test the idea, the American Public Health Association presents this Albert Lasker Award in recognition of their preeminent contributions to man's knowledge of biology.

Summer Statistics Program to Be Repeated

The 1958 summer statistics program at the University of Michigan School of Public Health was considered so successful that it will be repeated in 1959. The attendance at the 1958 program, which was planned cooperatively by the accredited schools of public health, was 74 students.

The 1959 program will be essentially the same with the addition of a new course in registration and vital statistics. There will also be a series of special lectures on topics of interest. A printed announcement of the program will be available later from Dr. F. M. Hemphill, director, Summer Program on Statistics in the Health Sciences, University of Michigan School of Public Health, Ann Arbor.

ASSOCIATION NEWS

OFFICERS 1958–1959

PRESIDENT—Leona Baumgartner, M.D., New York, N. Y.
PRESIDENT-ELECT—Malcolm H. Merrill, M.D., Berkeley, Calif.
VICE-PRESIDENT—Abraham Horwitz, M.D., Santiago, Chile
VICE-PRESIDENT—F. Burns Roth, M.D., Regina, Canada
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TREASURER—Charles Glen King, Ph.D., New York, N. Y.
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EXECUTIVE DIRECTOR—Berwyn F. Mattison, M.D., New York, N. Y.
DEPUTY EXECUTIVE DIRECTOR—Thomas R. Hood, M.D., New York, N. Y.

Dr. Baumgartner—The New President

Leona Baumgartner, M.D., health commissioner of New York City, inducted into office at the 86th Annual Meeting in St. Louis, is the second woman to be elected to the Association's presidency. Martha M. Eliot, M.D., 1948 president, was the first so honored.

The uniqueness of Dr. Baumgartner as the health commissioner of the largest city in the world is emphasized in the November issue of "Today's Health," of the American Medical Association. The lead article, with her smiling face on the cover, is entitled "Leona Baumgartner, Doctor to Eight Million." Text and pictures follow showing her in a wide range of health department and community activities, besides making good biscuits for her husband's breakfast.

Dr. Baumgartner grew up in a medical family. Her degree in bacteriology from the University of Kansas in 1923 was followed by a master's degree in immunology, a year of graduate research at the Kaiser Wilhelm Institute in the University of Munich, a Ph.D. degree from Yale in 1932. At this point she decided that her chosen public health career needed an M.D. degree as well, which she was awarded by Yale in 1934.

Dr. Baumgartner has been in the New York City Health Department since 1937, except for a year when she was on leave as associate director of the U. S. Children's Bureau. She was successively director of training, district health officer, and for 13 years in charge of the department's child health services, first as the director of the Bureau of Child Hygiene and later as assistant commissioner in charge of maternal and child health services. She has been health commissioner since 1954 by appointment of Mayor Robert E. Wagner.

Beginning in 1934, Dr. Baumgartner has been receiving awards of a number and variety too extensive to list—18 during the 24 years. Among these is a special APHA Lasker Award in Public Health Administration in 1954. Others are an honorary fellowship in the Royal Society of Health, an "Outstanding Professional Woman of the Year" citation from the Business and Professional Women's Clubs of New York State, and an Elizabeth Blackwell citation of the New York Infirmary.

Many national and local agencies have the services of Dr. Baumgartner as a consultant or board member. She is on the Board of Directors of the New York Fund for Children, is special consultant to the National Institute of Neurological Diseases and Blindness, and is a member of the Advisory Committee on the National Health Survey of the Public Health Service. In 1945 she was an adviser to the French Ministry of Health,

in 1955 to the minister of health in India. She was president of the National Health Council in 1956 and serves on its board of directors.

What Dr. Baumgartner envisions during her year's presidency is indicated in these words taken from her remarks at the Friday morning symposium of the 86th Annual Meeting in St. Louis: "I feel that what is going on now is that we have our eyes on the future with an 'air of expectancy.'" Quoting from Dr. Alan Greeg, she said, "The characteristic of a truly great organization—there is only one—is one in which you could feel, in which you could hear, in which you knew the members had an air of expectancy."

"We are continually being reminded of the advances and progress of medicine, and unquestionably many things are possible today which were impossible one or two generations ago. But, without detracting from these diagnostic and therapeutic achievements, I think it fair to point out that the real progress is much less than is claimed. We have managed to change the pattern of disease: that is all. As in everything else, solving one problem leads to the appearance of new ones, often more difficult or intractable than the first, and in some directions at least we seem to be approaching problems that cannot be solved. Proportionately, more doctors are kept busy today than fifty or a hundred years ago; but taken as a whole, there seems to be no evidence that there is less disease. Where once a man's first illness might well be his last, today he can clear many obstacles before reaching his grave."—R. L. Manning: Where Does Medicine Fit In? Lancet (Dec. 21), 1957, p. 1274.

NEWS OF AFFILIATED SOCIETIES AND BRANCHES

APHA AFFILIATED SOCIETIES AND BRANCHES

SOCIETY AND SECRETARY

ALABAMA PUBLIC HEALTH ASSOCIATION, Norma L. Chandler, State Health Dept., Montgomery
ARIZONA PUBLIC HEALTH ASSOCIATION, Mrs. Verona Massey, State Dept. of Health, Phoenix
ARKANSAS PUBLIC HEALTH ASSOCIATION, Mrs. Vada Russell, State Health Dept. Bldg., Little Rock
CALIFORNIA, NORTHERN, PUBLIC HEALTH ASSOCIATION, Mrs. Dalrie S. Lichtenstiger, 130 Hays St., San Francisco, Calif.
CALIFORNIA, SOUTHERN, PUBLIC HEALTH ASSOCIATION, Byron O. Mork, M.D., University of California at Los Angeles, Los Angeles
COLORADO PUBLIC HEALTH ASSOCIATION, Alice de Bruyn Kops, 4660 S. Delaware, Englewood, Colo.
CONNECTICUT PUBLIC HEALTH ASSOCIATION, E. Louise Ratcliff, M.P.H., New Haven TB&H Assn., Whitney
CUBAN PUBLIC HEALTH SOCIETY, Dr. Raphael Calvo Fonseca, Calle 19 No. 511 Altos Vedado, Havana
FLORIDA PUBLIC HEALTH ASSOCIATION, Nathan J. Schneider, Ph.D., P. O. Box 210, Jacksonville
GEORGIA PUBLIC HEALTH ASSOCIATION, Carl Fox, 33 Pryor St., N.E., Atlanta
HAWAII PUBLIC HEALTH ASSOCIATION, Sadamoto Iwashita, Dept. of Health, Honolulu
IDAHO PUBLIC HEALTH ASSOCIATION, Wesley O. Young, D.M.D., P. O. Box 640, Boise
ILLINOIS PUBLIC HEALTH ASSOCIATION, William J. Hixon, Evanston Health Dept., Evanston
INDIANA PUBLIC HEALTH ASSOCIATION, Gale E. Coons, State Board of Health, Indianapolis
IOWA PUBLIC HEALTH ASSOCIATION, Mary L. Wombacher, State Dept. of Health, Des Moines
KANSAS PUBLIC HEALTH ASSOCIATION, Evelyn Ford, State Board of Health, State Office Bldg., Topeka
KENTUCKY PUBLIC HEALTH ASSOCIATION, Mrs. Rosalie Walters, 620 S. Third St., Louisville 2
LOUISIANA PUBLIC HEALTH ASSOCIATION, Andrew Hedneg, M.D., State Dept. of Health, New Orleans 7
MARYLAND PUBLIC HEALTH ASSOCIATION, Lillian B. Davis, Sc.D., Department of Health Education, Baltimore
MASSACHUSETTS PUBLIC HEALTH ASSOCIATION, Mrs. Elizabeth K. Caso, Dept. of Health, Cambridge
MICHIGAN PUBLIC HEALTH ASSOCIATION, Maurice J. Mayer, 405 Hollister Bldg., Lansing
MINNESOTA PUBLIC HEALTH CONFERENCE, D. S. Fleming, M.D., State Dept. of Health, University Campus, Minneapolis
MISSISSIPPI PUBLIC HEALTH ASSOCIATION, H. E. Boone, P. O. Box 1700, Jackson
MISSOURI PUBLIC HEALTH ASSOCIATION, Mrs. Nadia Craver, 5th Fl., State Office Bldg., Jefferson City
MONTANA PUBLIC HEALTH ASSOCIATION, Elizabeth Bishop, M.D., P. O. Box 638, Hardin
NEBRASKA PUBLIC HEALTH ASSOCIATION, Orville D. DeFrain, Lincoln-Lancaster County Health Dept., Lincoln
NEW MEXICO PUBLIC HEALTH ASSOCIATION, Daniel T. Marley, P. O. Box 8066, Albuquerque
NEW YORK CITY, PUBLIC HEALTH ASSOCIATION OF, Allan Marlowe, 295 Flatbush Ave., Brooklyn 1
NEW YORK STATE PUBLIC HEALTH ASSOCIATION, Mrs. Kathleen Boland, State Dept. of Health, 84 Holland Ave., Albany
NORTH CAROLINA PUBLIC HEALTH ASSOCIATION, R. W. Brown, Bucombe County Health Dept., Asheville
NORTH DAKOTA PUBLIC HEALTH ASSOCIATION, Jean E. Norton, R.N., Box 133, Bismarck
OHIO PUBLIC HEALTH ASSOCIATION, Virginia Jones, Ohio Dept. of Health, Dayton
OKLAHOMA PUBLIC HEALTH ASSOCIATION, Marjorie Butler, 3400 North Eastern, Oklahoma City
OREGON PUBLIC HEALTH ASSOCIATION, Christie Corbett, R.N., State Board of Health, Portland
PENNSYLVANIA PUBLIC HEALTH ASSOCIATION, Emma J. Petach, R.N., 324 N. Second St., Harrisburg
PUERTO RICO PUBLIC HEALTH ASSOCIATION, Mrs. Luisa L. Trinidad, Santurce
SOUTH CAROLINA PUBLIC HEALTH ASSOCIATION, Mrs. Laura M. DeMarse, State Health Dept., Columbia
SOUTH DAKOTA PUBLIC HEALTH ASSOCIATION, Alice Brady, R.N., State Dept. of Health, Pierre
TENNESSEE PUBLIC HEALTH ASSOCIATION, C. B. Tucker, M.D., State Dept. of Health, 420 Sixth Ave., N., Nashville
TEXAS PUBLIC HEALTH ASSOCIATION, Joseph N. Murphy, Jr., State Dept. of Health, Austin
UTAH PUBLIC HEALTH ASSOCIATION, Mrs. Virginia Cole, City Health Dept., 115 S. State St., Salt Lake City
VIRGINIA PUBLIC HEALTH ASSOCIATION, William A. Dorsey, P. O. Box 2085, Richmond
WASHINGTON STATE PUBLIC HEALTH ASSOCIATION, Thomas Drummey, State Dept. of Health, Smith Tower, Seattle
WEST VIRGINIA PUBLIC HEALTH ASSOCIATION, Paul B. Shanks, State Health Dept., Charleston
WISCONSIN ASSOCIATION FOR PUBLIC HEALTH, Paul Wels, 1 W. Wilson St., Madison
MIDDLE STATES BRANCH, A.P.H.A., Thelma Luther, State Dept. of Health, Des Moines, Iowa
SOUTHERN BRANCH, A.P.H.A., Betty Ficquett, State Board of Health, Columbia, S. C.
WESTERN BRANCH, A.P.H.A., Mrs. L. Amy Darter, State Dept. of Health, 2151 Berkeley Way, Berkeley, Calif.

Florida Public Health Association Meets

The Florida Public Health Association —some 650 strong—met in West Palm Beach October 2–4. At this 30th annual conference there were three general sessions and two afternoons devoted to meetings of each of seven sections. One general session was devoted to voluntary agencies which were described as an "outpouring of goodwill" by the keynote speaker, Louis I. Dublin, M.D.

At another general session devoted to accident prevention a battery of panelists discussed safety on the highway, in the home, in schools, the statistics of accidents, accident proneness, and what should be a state health department accident prevention program. Among the remarks heard here were: "Common horse sense is all the individual needs to prevent accidents" and "If you are careless enough your car will last you a lifetime."

The presidential address by the retiring president, Fred B. Ragland, director of the State Health Department's Bureau of Finance and Accounts, was given at the opening general session. He suggested that the purpose of the conference was to consider "ways and means of helping its individual members and the organizations with which they are affiliated to continue their fight to roll back the frontiers of disease and ill health." At this session also Surgeon General Leroy E. Burney and APHA Executive Director Berwyn F. Mattison, M.D., spoke. Dr. Burney suggested that the principles of planning and management applied to money should be applied equally to health, which is a far greater asset.

The health officers section devoted an entire session to "Research in Local Health Units." The mental health section had one session on "Mental Health Applications to Public Health Functions." The clerical section among its discussions included "Frontline in Human Relations."

The following officers were elected:

President—A. Y. Covington, M.D., director, Bradford County Health Department

Vice-Presidents—Norman L. Tuckett, Jr., sanitary engineer, Broward County Health Department; Sara Louise Smith, D.Ed., professor of health education, Florida State University

Secretary—Nathan J. Schneider, Ph.D., director, Bureau of Laboratories, State Board of Health (reelected)

Treasurer—Estelle S. Lloyd, Jacksonville

Delegate to APHA Governing Council—Wilson T. Sowder, M.D., state health officer.

48 Affiliates Now

Two new public health associations were welcomed into the APHA family at the 86th Annual Meeting in October. The Hawaii Public Health Association became the 45th Affiliated Society and the Middle States Public Health Association, the third branch of the APHA. (The Maryland Public Health Association became the 44th Affiliated Society just prior to the Annual Meeting.)

In greeting the new affiliates, the executive director, Berwyn F. Mattison, M.D., said he looked forward to an increase in the mutual exchange of information and services. The result will be closer working relationships among the state, branch, and national associations with the ultimate goal of adding strength to each group and to the public health profession.

Maryland Meeting as an Affiliate

The meeting of the Maryland Public Health Association celebrated its acceptance as the 44th APHA affiliate at its fourth annual meeting on October 3. The society was later invested with all its rights, privileges, and duties as an affiliate at the APHA Annual Meeting in St. Louis.

Among the problems discussed at the October 3 meeting were those of metropolitan fringe growth. Representatives of the state cancer, crippled children, heart, mental health, and tuberculosis associations made up a panel discussing the record and future of the categorical agency. Evaluation was the keynote of each agency's discussion. The Gunn-Platt report of 1945 was recommended for rereading. The moderator of this session urged the association to call the agencies together for continuing study and discussion.

William R. Willard, M.D., dean of the University of Kentucky College of Medicine, gave the luncheon address on "The University Medical Center as a Community Resource for Health Sciences." He reviewed some of the planning preceding the opening of the new four-year medical school in the university which focused on coordinating all aspects of education and service to meet the needs of the community. In this planning the social and behavioral sciences were fully involved.

Helen B. Taussig, M.D., associate professor of pediatrics, reported her observations as leader of a six-woman team of physicians who recently visited the Soviet Union.

The following officers were elected:

President—William J. Peeples, M.D., health officer, Montgomery County

President-Elect—Ferdinand D. Korff, director, Bureau of Food Control, Baltimore Health Department

Vice-President—James Hampton, director, Dorchester County Welfare Department

Secretary—Lillian B. Davis, Sc.D., supervisor of health education, Baltimore Department of Education

Treasurer—Lee S. Bowers, director of education, Heart Association of Maryland

Representative to APHA Governing Council—Perry Prather, M.D., Maryland state health officer.

Washington Association Thinks Bold

"Bold new thinking" is the description of what went on at the 23rd annual conference of the Washington State Public Health Association in Yakima in October. In order that the state's public health program may properly meet its responsibility an intensive study of local financing, preferably by a health officers' committee, was recommended. Also recommended was an ad hoc committee to determine needed changes in districting and programming of local health departments and how these changes are to be brought about. The question of a uniform merit system for county and district health departments also needs exploration.

With respect to the problem of personnel there was a resolution asking that the American Public Health Association make a nation-wide study of personnel recruitment requirements for employment and methods for retaining trained personnel.

A paid up membership of 527 was reported, representing a 73 per cent increase over 1957.

Seymour Standish, assistant to the chairman, Board of Health Sciences, University of Washington, succeeded John E. Van Amburgh of the Sanitation Division, Seattle-King County Health Department, as president. Other officers elected are:

President-Elect—Vernon Michael, M.D., health officer, Benton-Franklin Counties

Vice-President—Peggy Kopf, public health nurse, Tacoma-Pierce County Health Department

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EMPLOYMENT SERVICE

The following pages present information for those seeking public health personnel and for those seeking positions in public health. Other information concerning vacancies and personnel available is on file in the Association office. Anyone wishing to have the benefit of this additional information can obtain it by writing to the Vocational Counseling and Placement Service of the Association.

Advertising space in these pages is available at special rates for the use of employers or individuals. The charges are $5 for the first 50 words or fraction thereof and $1 for each additional 10 words or fraction thereof. There is no charge to members or Fellows of the Association who desire to utilize the **Positions Wanted** portion of these pages. **Closing date** for receipt of advertisements is the first of the month preceding the desired month of publication. **All correspondence should be sent to the American Public Health Association, 1790 Broadway, New York 19, N. Y.**

POSITIONS AVAILABLE

Medical Health Officer—for Jefferson County Health Department (population 105,000). Offices in Golden, Colo., site of Colorado School of Mines. This unit has a well trained staff of nurses and sanitarians. Qualifications require an M.P.H. and experience in the field of public health. Salary starts at $11,772. Address inquiries to Dalton Roberts, Chief, Administrative Services, Colorado State Department of Public Health, 420 State Office Bldg., Denver 2, Colo.

Health Statistician—to render consultant services in programs and projects of the Pan American Sanitary Bureau, Regional Office of the World Health Organization, with assignment to a Latin-American country and travel to neighboring countries. Requirements: Professional degree, M.D., Ph.D., or equivalent in public health, with specialization and experience in health statistics. Attractive salary and allowances. For further details write to Personnel Officer, PASB/WHO, 1501 New Hampshire Ave., N.W., Washington 6, D. C.

Wanted: **Health Officers**—for local units in Florida. **Health Officer IV**—$11,040–$13,800; **Health Officer III**—$10,080–$12,600; **Health Officer II**—$9,120–$11,520; **Health Officer I**—$7,200–$9,120. Each applicant is rated on a basis of experience and training. Good state retirement, plus Social Security; Merit System protection; travel allowance 10 cents per mile; 40-hour week; work in vacation surroundings. Apply to Wilson T. Sowder, M.D., State Health Officer, P. O. Box 210, Jacksonville 1, Fla.

Medical Health Officer—for established rural county health department in central Illinois. Good personnel policies with vacation and retirement. Salary range $9,600–$12,000 for physician with public health training and experience. Contact W. T. Douglas, M.D., Hillsboro, Ill.

Medical Health Officer—for a four-county area in the Upper Peninsula of Michigan having a population of 53,000. Starting salary $11,500. Paid vacation and sick leave. For further information write to the Copper Country District Health Department, 106 Shelden Ave., Houghton, Mich.

Assistant Public Health Director—for Arlington County, Va. Salary range $9,000–$11,000 a year. United States citizenship and eligibility for a license to practice medicine in Virginia required. Training or experience in public health administration desirable. Age to 50. Apply Arlington County Personnel Department, Court House, Arlington, Va.

District Health Officers, Wisconsin—Two positions. Headquarters Rhinelander and Fond du Lac. M.P.H. degree and eligibility for license to practice medicine in Wisconsin required. Salary $10,464–$14,484, commensurate with experience. Write E. H. Jorris, M.D., Assistant State Health Officer, 400 State Office Bldg., Madison 2, Wis.

Director, Local Health Services, Wisconsin—Work with the state health officer and professional staff in improvement of local health services. M.P.H. degree and eligibility for license to practice medicine in Wisconsin required. Salary $10,464–$14,484, commensurate with experience. Write E. H. Jorris, M.D., Assistant State Health Officer, 400 State Office Bldg., Madison 2, Wis.

Public Health Nurses—for rural areas of Colorado. Salary $325–$350 per month, depending on experience and training in public health. Excellent personnel policies, including generous mileage allowance for car. Educational stipends available. Apply Colorado State Department of Public Health, Nursing Section, 1422 Grant St., Denver 3, Colo.

Public Health Nurse—Open to female

resident citizens of the United States who possess the minimum qualifications. Salary range $75–$90 weekly. Complete details may be secured by writing to Personnel Director, Municipal Bldg., Hartford, Conn.

Public Health Nurse Director—in voluntary public health nursing service with generalized program and expanding services. Eight nurses on staff. Position offers challenge in rapidly growing area. Administrative ability and M.A. required. Starting salary $6,180. Good personnel policies, attractive office space, liberal vacation and sick leave. Apply Public Health Nursing Association for Burlington County, Inc., 204 High St., Mt. Holly, N. J.

Public Health Nurses—Ten-nurse agency, generalized service under supervision, beginning salary $4,630, 35-hour week, three weeks' vacation, retirement plan, and Social Security. Apply to Director of Nurses, Mount Vernon Department of Health, Mount Vernon, N. Y.

Public Health Nurses—Must be eligible for license in New York State; public health nursing preparation required; city health department generalized program; 35-hour week; civil service; retirement plan plus Social Security; liberal hospitalization and vacation benefits; two weeks' annual sick leave cumulative to 120 days. Salary $4,360–$5,580 in four annual increments, plus $250 longevity increments at the end of 10, 15, and 20 years of service. Write Chester A. Hicks, M.D., Director of Public Health, New Rochelle, N. Y.

Public Health Nurses—Beginning salary $4,440. **Graduate Nurses**—Beginning salary $4,020. Five-day work week from 8:30 a.m. to 4:30 p.m. Four weeks' vacation, 11 holidays, 12 days' sick leave annually, pension plan. Generalized public health nursing agency founded by Lillian D. Wald. Ongoing inservice education program. Four universities offer opportunities for study at all levels. Some scholarship assistance available. For information, write or call Personnel Office, Visiting Nurse Service of New York, 107 East 70th St., New York 21, N. Y. Telephone Lehigh 5–1100.

Public Health Nurse Supervisor—Excellent opportunity. Liberal personnel policies. Salary range $4,600–$5,980. Generalized program, including rehabilitation, industry, nursery schools, parents' classes, crippled children's clinics. Highly industrialized and agricultural community in southeast central Pennsylvania—50 miles from Baltimore, 90 miles from Philadelphia and Washington. Write Director, Visiting Nurse Association, 218 E. Market St., York, Pa.

Virologist—State Virus Laboratory. Master's degree with virus training and two years' experience. Salary $440–$550. Entrance step dependent on qualifications. Excellent opportunity in diagnostic and research activities in newly established and well equipped laboratory. State Board of Health, Helena, Mont.

Wanted: **Medical Bacteriologist**—B.S. degree plus experience. Starting salary $6,000 per annum. Write Dr. Robert T. Rogers, St. Lawrence County Laboratory, Canton, N. Y.

Public Health Engineer II—Qualifications: Master's degree with at least two years of experience in a state or local health department. Duties: Direction of activities of the Sanitation Division, one of three major divisions of the Bureau of Environmental Sanitation, supervision of 37 employees. Civil service position. Vacation, sick leave, medical and hospital insurance, and liberal pension plan. Salary range $7,371–$7,987. Write to E. R. Krumbiegel, M.D., Commissioner of Health, Milwaukee Health Department, 200 E. Wells St., Milwaukee 2, Wis.

Public Health Educator I—Qualifications: College degree with at least one year of postgraduate study in public health education and at least one year's experience in a public or voluntary health agency. Duties: Carrying out health education programs under the direction of Health Educator II. Salary range $5,271–$6,030. Civil service position. Vacation, sick leave, medical and hospital insurance, and liberal pension plan. Write to E. R. Krumbiegel, M.D., Commissioner of Health, Milwaukee Health Department, 200 E. Wells St., Milwaukee 2, Wis.

Opportunities for **Health Educators, Florida**—Travel allowance, vacation, sick leave, state retirement, Social Security, hospitalization (optional). **Health Educator I**—($3,600–$4,560), B.S. in education, social work, or nursing. A central county health department (in citrus area, urban-rural). **Health Educator II**—($4,140–$5,280), B.S., with an M.P.H. in public health or health education, or an equivalency of five years in teaching science. An east coast county health department (fastest growing). Apply to Miss Elizabeth Reed, Director, Division of Health Information, Florida State Board of Health, P. O. Box 210, Jacksonville, Fla.

Public Health Educator III—Initiate and develop school-community health education programs in a multicounty district. Desirable qualifications: M.P.H. degree plus two years' experience in health education; sound working knowledge of principles of education and methods of teaching. Salary $482–$577 per month. Travel allowance, vacation, sick leave, retirement, group insurance plans. Write Dr. Amy L. Hunter, Director, Bureau of Maternal and Child Health, Wisconsin State Board of Health, Madison 2, Wis.

POSITIONS WANTED

On Box Numbers, Address APHA at 1790 Broadway, New York 19, N. Y.

Pediatrician—M.P.H. Desire position in teaching or research facility with strong clinical emphasis. (Do not wish maternal and child health administration assignment.) **Box PH-79,** Employment Service, APHA.

Director of Laboratory—Ph.D. Desire responsible position in developing public health laboratory program. Extensive teaching and research publication experience in virology and microbiology. Considerable background in infectious diseases in the United States and abroad. **Box L-66,** Employment Service, APHA.

Applied Entomologist—M.S. in medical entomology. Seven years in sanitation division of a state health department, planning and supervising wide variety of vector control programs. Past four years in responsible position with large municipal organization involving administration and public relations. Desire position requiring comprehensive background of all phases of vector control and public health sanitation. **Box L-67,** Employment Service, APHA.

Commercial Advertisements

All communications on the following commercial advertisements should be sent to Burneice Larson, Medical Bureau, Suite 605, 900 North Michigan Avenue, Chicago 11, Ill.

OPPORTUNITIES AVAILABLE

(a) Director and assistant director of public health; degree and experience required; foreign appointments; two-year contracts; $25,000 and $20,000 annually, respectively. (b) Director, new county health department, Colorado. (c) Physician to join staff, division of preventive medicine, county health department, California. (d) Young board internist to become clinical director health service, also act as assistant director; 20,000 students; expansion program; Midwest; $15,000. (e) Young internist; duties consist of part time in student health and part time in department of medicine; faculty rank of instructor; South. (f) Industrial hygienist and sanitarian; minimum, B.S. degrees required; foreign operations, large industrial company; salaries, respectively, $1,150 and $955 monthly. (g) Assistant director of health education; state health department, West. (h) Chief, food and sanitation inspector; community of 60,000 on Lake Michigan near Chicago; degree in public health, preferably master's. (i) Supervisor, V.N.A., 15 employes; town, 60,000, Pennsylvania; to $6,000. (j) Consultant, public health nursing, industrial hygiene division; leading metropolitan area, East Coast; to $7,800. (k) Nurse for seven grade schools; $400 month, plus expenses; all school vacations observed; beautiful college town near Chicago.

OPPORTUNITIES WANTED

Opportunities for candidates in the fields of medicine, science, nursing, teaching, administration. Candidates in all parts of the country. Negotiations strictly confidential. Medical Bureau, Burneice Larson, Director, 900 North Michigan, Chicago.

BOOKS AND REPORTS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.

THE AGED IN AMERICAN SOCIETY—By Joseph T. Drake. New York: Ronald Press (15 East 26th St.), 1958. 431 pp. Price, $5.50.

The author's statement, "The purpose of this book is to bring together under one cover information and data from many sources on all the pertinent aspects of gerontology," is a large order which is not fulfilled. The book is divided into five major parts which deal with demographic characteristics of the population; employment of the aged; pension and retirement systems; physiological and psychological characteristics of the aged; and housing, recreation and educational programs for the aged.

The chapters dealing with employment, income, population, and retirement plans contain information of value to individuals who have recently become interested in social action programs for the aged. The historical descriptions of the development of the Old-Age and Survivors Insurance Program and the Railroad Retirement System are of special interest.

Chapters dealing with the physiological and psychological characteristics of aging people are superficial and contain errors of omission. For example, the author lists "the more prevalent diseases of later life" but omits cardiovascular diseases (page 288). References in these chapters are largely to secondary sources, and even these are confused in the bibliography, as, for example, the listing of nonexistent chapters from "Cowdry's Problems of Ageing," using the 1939 edition rather than that for 1952 edited by A. I. Lansing. Problems of health maintenance and medical care are also dealt with superficially. The question raised by the author on page six, "Can society create status positions for its older members?" remains unanswered when the reader has reached the bottom of page 400.

N. W. SHOCK

PREGNANCY AND BIRTH: A BOOK FOR EXPECTANT PARENTS—By Alan F. Guttmacher. (A Signet Key Book.) New York, N. Y.: New American Library (501 Madison Ave.), 1958. 255 pp. Price, $.50.

The publication of Dr. Guttmacher's "Pregnancy and Birth" by Signet Key Books in a paper-back edition will make this excellent guide for parents available to a much wider audience. It is a clear, concise up-to-date discussion of the natural function of pregnancy and birth and the medical care which accompanies it.

Those who know Dr. Guttmacher as an obstetric historian will be delighted with the fascinating bits of historical information woven into the text. He introduces the chapter on twins, for instance, with the story of Lady Margaret Hagenau who, in the year 1313, "was brought to bed with 365 children at one and the same time. Milady's superfecundity came about in a miraculous way through God's displeasure."

Dr. Guttmacher points out that the medical profession, which has been responsible for maternity care only in recent years, inherited a tradition from the centuries which looked upon childbearing as an illness. The shackles of this attitude have now been shaken off. "We now realize," he writes, "that pregnancy is a normal, simple physiological state and ordinarily all that needs to be done is to maintain the woman in good physical condition by the enforcement of an uncomplicated, common sense regimen."

Perhaps Dr. Guttmacher puts too much stress on what the doctor and nurse can do for the mother and too

little on what the expectant parents can do for themselves under medical tutelage. But he does emphasize that every mother is an individual and must be treated as such.

This book delivers a hopeful message. The author points out that in today's obstetric practice "a relative frequency of the normal and the abnormal is as more than nine to less than one. The task of the future is to raise the odds still higher."

Most certainly the reader needs to know that these odds can be increased still further and that the responsibility for this increase rests with the mothers and fathers as well as the members of the medical profession.

"This is a wonderful time to have a baby, wonderful for both mother and baby," Dr. Guttmacher says in his epilogue, "for in the long history of man birth has never been so safe. The progress made in this area during the past two decades defies imagination."

HORACE HUGHES

FREEZING PRESERVATION OF FOODS, COOKED AND PREPARED FOODS (Vol. II)—By Donald K. Tressler and Clifford F. Evers (3rd rev. ed.). Westport, Conn.: Avi Publishing Company (7 Taylor Place), 1957. 559 pp. Price, $10.00.

Because of the ever-increasing consumption of frozen precooked foods, a second volume of 559 pages dealing exclusively with this subject has been added to the third edition of this standard text. Among the more important subjects covered in the 24 chapters are packaging, soups and stews, poultry, meats, fish and seafoods, fruit pies and other fruit products, sauces, toppings, batters and doughs, bread and rolls, cakes, ice cream, sherbets, confections, and complete meals. There are also chapters on storage, equipment, and food freezing for public feeding establishments. While most of the material presented is not original with the authors, the latter have compiled and collated a vast amount of pertinent literature in this fast-moving field. The extensive bibliographies at the end of each chapter point the way to important source material. The book is written in an easy practical style and is filled with typical formulas, tests, procedures, and standards. Process descriptions are clear. The 126 illustrations aid greatly in understanding processes and equipment. Both authors have been associated with frozen foods since the first developments more than 30 years ago. Their vast and continued experiences in this field lend authority to the present volume. This is the first comprehensive text in the field.

While little attention is allotted to the public health aspects of precooked and prepared frozen foods, the public health officer can readily evaluate the processes and products from the complete descriptive data given in the book. There are many problems still remaining to be solved regarding the keeping quality of these products at different temperatures, bacterial build-up, possibility of food poisoning, and the growth of microorganisms at subfreezing temperatures. The present text serves as a most useful source material for such studies. Because of the importance of frozen foods in the diets of the American people, public health officials need an authoritative text like this one in their bookcase.

CARL R. FELLERS

GLAUCOMA—Transactions of the Second (1956) Conference. Edited by Frank W. Newell. New York, N. Y.: Josiah Macy, Jr. Foundation, (16 West 46th St.), 1957. 245 pp. Price, $4.95.

The informal discussion, questions, and comments are presented in this excellent volume much as they were at the conference. Facts and theories about mechanisms concerned with aqueous formation, mathematical formulations of aqueous dynamics, mechanisms of trans-

port by membranes, and applanation tonometry are discussed. This book is a must for anyone who wishes to be informed on the basic research which is going forward on these aspects of a leading cause of blindness.

FRANKLIN M. FOOTE

THE COMMUNITY—An Introduction to a Social System—By Irwin T. Sanders. New York: Ronald Press (15 East 26th St.), 1958. 431 pp. Price, $6.00.

This is a synthesis of recent research which has pertinence for the American settlement and interaction unit known as the "Community." Even though the author has designed his book as a text for students who already have taken some sociology, he is careful to explain each new concept when it appears. The studies of others are supplemented by the author's, which have been done in rural and urban areas here and abroad. These are used to illustrate "The Social Traits of the Community" in Part I, "The Major Systems at Work" in Part II, and "Community Action" in Part III. Comparisons of aspects of life in Palpoda, Ceylon; St. Denis, Quebec; Yokogshi, Japan; and other communities with those in the United States provide meaningful prospective.

There is no doubt about the excellence and utility of this book. It is well written, well organized, and quite complete in terms of the knowledge of human behavior in communities that is existent today. It is more than a text on the community in that it explains and uses many of the concepts from general sociology and cultural anthropology. It will provide a sound basis for students of society whether they intend to specialize in the social sciences, public health, nursing, medicine, or in another field. It will also be helpful as a resource book for community research and action professionals.

Although this is a text the reviewer would use for his own students, he would like to mention that the chapter entitled "Community as an Arena of Interaction" in Part I, though important, may be somewhat repetitious. Interaction is implicit in almost all the rest of Part I as well as in other sections of the book.

It might be pointed out that in several instances the author was not sufficiently critical of the data he used. The limitations of some of the generalizations presented should have been noted; but the criticisms this reviewer has do not materially affect the utility of the book.

WALTER E. BOEK

ABORTION IN THE UNITED STATES—Edited by Mary Steichen Calderone. New York: Hoeber (49 East 33rd St.), 1958. 224 pp. Price, $5.50.

This is a report of a conference sponsored by the Planned Parenthood Federation of America held in April, 1955, to discuss an ugly problem—illegal abortion. The conference participants, all with experience in one or more aspects of abortion, have approached the problem with amazing frankness.

Whereas abortion was being discussed primarily as it relates to the United States, there are valuable contributions made by participants from other countries, notably the Scandinavian countries. Reviewed, with supporting data and whatever statistics are available, are the legal aspects of abortion, illegal abortion, therapeutic abortion, abortion and contraception, and other aspects of the abortion problem.

No reader can fail to gain valuable insight into the many ramifications of the abortion problem by reading this conference report. It is clearly written and at times brutally frank. The general essence is that it is high time the United States take a new and realistic look at a situation that is causing untold suffering. Physicians, sociologists, legislators, religious leaders, educators, lawyers, public health officials, and the en-

tire public need to be made aware of what is going on and why before there can be hope of any progress toward arriving at a solution.

J. WHITRIDGE, JR.

COMMUNITY WELFARE ORGANIZATION—PRINCIPLES AND PRACTICE—By Arthur Dunham. New York: Crowell (432 Fourth Ave.), 1958. 480 pp. Price, $5.75.

This is a textbook and a good one. The author is a renowned professor at the Michigan School of Social Work who draws on a lifetime of rich experience. The book is forward looking and is well constructed. It is broad in scope, yet succinct and written in a direct, simple, forceful language. Necessarily, some subjects are reduced almost to oversimplification, yet the references and guides to further study make it a useful tool also for the more advanced student. The bibliography and appendixes of basic references are unusually good. There is extensive and skillful use of case illustrations, and one gets the feeling that they are real cases. The historical chapters are excellent and are important for students and practitioners of community organization in the health field. Another practical section of particular significance to health workers concerns social action; this is a succinct, sensible, and basic presentation, far better than the frequent, thin how-to-do-it treatises. The summary chapter and section on frontiers of community organization are very good. This book is recommended as a basic volume for public health libraries.

ROSCOE P. KANDLE

OVERCOME ARTHRITIS—By William Kitay. Englewood Cliffs, N. J.: Prentice-Hall, 1957. 256 pp. Price, $4.95.

It is not often that one finds a medically accurate handbook on any disease that is written in simple terms understandable to the layman. This, however, is such a book. The author, formerly science and medical editor of the Arthritis and Rheumatism Foundation, has profited from his close association with the outstanding rheumatologists in this country to write a sound and readable guide for arthritis patients.

Throughout the volume there is emphasis on what the patient can do to help himself, especially in his own home. The basic triad of heat, massage, and therapeutic exercise is thoroughly discussed. There is an accurate assessment of the drugs currently accepted in the management of arthritis and unequivocal debunking of the many fads and fraudulent measures used by quacks to hoodwink hopeful arthritis sufferers. Appropriate emphasis is given the performance of the activities of daily living and the use of self-help devices.

One of the many helpful features of the volume is a chapter containing answers to 101 questions commonly asked by arthritis patients. Another is a listing of arthritis clinics, which unfortunately is incomplete.

The practicing physician can recommend this book without hesitation to his arthritic patients who will benefit greatly from it as a supplement to the individualized advice of their own doctor.

FRANK W. REYNOLDS

THE ALCOHOLIC CLIENT—Papers by Jean V. Sapir, et al. Reprinted from Social Casework. New York: Family Service Association of America (215 Fourth Ave.), 1957. 31 pp. Price, $.75.

Each of the five papers assembled in this pamphlet is based on a rich personal clinical experience with alcoholics and members of their families. These are papers of quality, well written and illustrated with case materials which are theoretically relevant, not merely anecdotal. Sapir stresses the need for the therapist to avoid stereotypes, to examine personal biases, and to individualize the alcoholic's problems. She analyzes the characteristics of impulsive-

ness and dependence so often manifested by the alcoholic and suggests a positive approach to these in the therapeutic setting. Wenneis presents an analysis of the therapeutic relationship with alcoholics which is positive and challenging. Peltenburg stresses similarities between the alcoholic and other emotionally disturbed patients and illustrates the importance of an active, well planned therapeutic approach. Lewis discusses characteristic problems presented by wives of alcoholics and their role in the total therapeutic situation.

This collection of papers contributes nicely to an understanding of certain dynamics of alcoholism, particularly as they are revealed in the casework setting.

For the many readers familiar with the brilliant work of the late linguist and anthropologist, Edward Sapir, it is noteworthy than Jean Sapir's writing reflects continuing credit on her late husband's name. ROBERT STRAUS

BOOKS RECEIVED

Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.

ANALYSIS OF DREAMS, THE. Medard Boss. New York: Philosophical Library, 1958. 223 pp. Price, $6.00.

AMERICAN COUNCIL OF INDEPENDENT LABORATORIES, INC. DIRECTORY (7th ed.). Chicago, Ill.: The Council, 1958. 100 pp.

CARE OF THE GERIATRIC PATIENT, THE. E. V. Cowdry, Editor. St. Louis, Mo.: Mosby, 1958. 438 pp. Price, $8.00.

CHILD-CENTERED GROUP GUIDANCE OF PARENTS. S. R. Slavson. New York: International Universities Press, 1958. 333 pp. Price, $5.00.

CONTEMPORARY SOCIOLOGY. Edited by Joseph S. Roucek. New York: Philosophical Library, 1958. 1209 pp. Price, $12.00.

CURRENT CONCEPTS OF POSITIVE MENTAL HEALTH. Marie Jahoda. New York: Basic Books, 1958. 136 pp. Price, $2.75.

DIAGNOSTIC BACTERIOLOGY (5th ed.). Isabelle G. Schaub, et al. St. Louis, Mo.: Mosby, 1958. 338 pp. Price, $4.75.

DICTIONARY OF PERSONNEL AND INDUSTRIAL RELATIONS. Esther R. Becker. New York: Philosophical Library, 1958. 366 pp. Price, $10.00.

EMERGENCY WAR SURGERY. NATO Handbook. United Nations Department of Defense. Washington, D. C.: Gov. Ptg. Office, 1958. 411 pp. Price, $2.25.

THE ENDEMIAL COLIC OF DEVONSHIRE—AN ESSAY CONCERNING ITS CAUSE. George Baker. Published in 1767—Reprinted by Delta Omega Society. New York: APHA (1790 Broadway), 1958. 74 pp. Price, $5.00.

EPILEPSY. Manfred Sakel. New York: Philosophical Library, 1958. 204 pp. Price, $5.00.

EXISTENTIALISM AND EDUCATION. George F. Kneller. New York: Philosophical Library, 1958. 170 pp. Price, $3.75.

FAMILY HANDBOOK OF HOME NURSING AND MEDICAL CARE, THE. I. J. Rossman and Doris R. Schwartz. New York: Random House, 1958. 403 pp. Price, $4.95.

INFECTIOUS DISEASES OF CHILDREN. Saul Krugman and Robert Ward. St. Louis, Mo.: Mosby, 1958. 340 pp. Price, $10.00.

LABORATORY INSTRUCTIONS IN MICROBIOLOGY (2nd ed.). Louis P. Gebhardt and Dean A. Anderson. St. Louis, Mo.: Mosby, 1958, 261 pp. Price, $3.75.

MASK OF SANITY, THE. (3rd ed.). Hervey Cleckley. St. Louis, Mo.: Mosby, 1955. 596 pp. Price, $8.50.

NEOPLASTIC DISEASE AT VARIOUS SITES. CARCINOMA OF THE LUNG. Vol. I. Edited by J. R. Bignall. Baltimore, Md.: Williams & Wilkins, 1958. 298 pp. Price, $10.50.

NONOPERATIVE ASPECTS OF PEDIATRIC SURGERY, THE. Report of the 27th Ross Pediatric Research Conference. Columbus, Ohio: Ross Laboratories, 1958. 95 pp.

NUTRITION AND DIET THERAPY FOR PRACTICAL NURSES. Lillian Mowry. St. Louis, Mo.: Mosby, 1958. 160 pp. Price, $2.50.

NUTRITION FOR YOU. Robert S. Goodhart. New York: Dutton, 1958. 215 pp. Price, $4.50.

PRACTICE OF SANITATION, THE. Edward Scott Hopkins. Baltimore, Md.: Williams & Wilkins, 1958. 487 pp. Price, $8.00.

PRINCIPLES AND TECHNICS OF REHABILITATION NURSING. Florence J. Terry, et al. St. Louis, Mo.: Mosby, 1957. 345 pp. Price, $5.50.

PRINCIPLES OF MICROBIOLOGY (3rd ed.). Charles F. Carter and Alice Lorraine Smith. St. Louis, Mo.: Mosby, 1956. 665 pp. Price, $6.50.

PROFESSIONAL ADJUSTMENTS (3rd ed.). Sister Mary Isidore Lennon. St. Louis, Mo.: Mosby, 1954. 381 pp. Price, $4.75.

PROGRESS IN PSITTACOSIS AND CONTROL. Edited by F. R. Beaudette. New Brunswick, N. J.: Rutgers, 1958. 256 pp. Price, $5.00.

REFUSE COLLECTION PRACTICE. Prepared by the Committee on Refuse Collection, American Public Works Association. Chicago, Ill.: Public Administration Service, 1958. 562 pp. Price, $8.00.

REHABILITATION MEDICINE. Howard A. Rusk. St. Louis, Mo.: Mosby, 1958. 572 pp. Price, $12.00.

SANITY, UNHEARD OF. Hugh Woodworth. Victoria, B. C.: Sumas Publishing, 1958. Price, $3.00.

SCHIZOPHRENIA. Manfred Sakel. New York: Philosophical Library, 1958. 334 pp. Price, $5.00.

SEROLOGICAL AND BIOCHEMICAL COMPARISONS OF PROTEINS. Edited by William H. Cole. New Brunswick, N. J.: Rutgers University Press, 1958. 119 pp. Price, $2.00.

TRIFLUOPERAZINE—CLINICAL AND PHARMACOLOGICAL ASPECTS. Forty-four Contributors. Introduction by Henry Brill. Philadelphia, Pa.: Lea & Febiger, 1958. 219 pp. Price, $3.50.

WHAT WE DO KNOW ABOUT HEART ATTACKS. John W. Gofman. New York: Putnam's, 1958. 180 pp. Price, $3.50.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

Raymond S. Patterson, Ph.D., F.A.P.H.A.

Bigger and Better?—You know, to be sure, that American children are taller and heavier than they were a generation ago, but this review paper presents some impressive statistics in a useful way. You may want to preserve a table of statistical evidence for your own educational purposes.

ANON. Children Growing Taller. Statist. Bull. Metrop. Life Insur. Co. 39, 9:1 (Sept.), 1958.

Luncheon Is Served—In Bremerton (Wash.) the school lunches are prepared in a central kitchen, then the individual hot and cold dishes are packaged in foil. Sufficient supplies for each school are shipped cold and just before serving the hot dishes are warmed in portable school ovens. The children eat at their desks and when the meal is finished the containers are wrapped for easy disposal. The plan is economical and approved by both the health authorities and the young customers.

ANON. Disposable Foil Containers for School Lunches that Are Clean, Efficient and Economical. Modern San. 10, 9:16 (Sept.), 1958.

Catch-Up Training—In Oklahoma, as in many another rural state, many public health nurse recruits are married, of an older age group, and unable to leave home for protracted periods. How can they be given the all-essential training? One answer will be found in this story of an educational program for im-

proving professional qualifications and performance. This story may have meaning for other states and situations.

ANON. New Hope for Rural Public Health Nursing. Am. J. Nursing 58, 10:1405 (Oct.), 1958.

Nursing for Old People—Two papers on what the British are doing—or see as needing to be done—are commended to all here who are concerned in any way with the care of the aged or chronically sick. Though British projects are based upon a generally available medical service quite different from ours, and they have domiciliary programs more inclusive than most of ours, their problems and their ways of meeting them are, at bottom, much the same. Probably they are doing a better job than some of us do.

ANON. The Evening of Life (and five related papers). Pub. Health 72, 6:201 (Sept.), 1958.

Asian Flu, Last Look At—An introduction to a well-filled-out symposium seems worthy of a quote: "We have recently been through an epidemic of influenza . . . not much worse than many other outbreaks but differing in two respects. First, it spread in a very obvious manner right across the world in six months; second, it has had a very good press . . . with, as a result, more alarm than the severity of the epidemic would justify. From the view of the scientific study of influenza epidemiology it has been a most interesting and important event."

ANDREWES, C. H., et al. The Etiology, Spread, and Control of Epidemic Influenza (four papers). Roy. Soc. Health J. 78, 5:533 (Sept.-Oct.), 1958.

Helpful Quiz—They asked the physicians of San Francisco if: (a) any of their patients had had need of services other than the medical care they received; (b) if they referred patients to health or welfare agencies; (c) what sort of needs were largely unmet; and (d) which needs should have priority in community service. More than half the physicians answered and their replies were helpful in community planning.

BABOW, I., et al. Experience with a Community Health Council Questionnaire for Practicing Physicians. J.A.M.A. 168, 3:268 (Sept. 20), 1958.

Major Health Problem—There are now 200 poison control centers supplying up-to-date information on toxicity and treatment of poisoning and encouraging research in preventive and educational practices. Among the poisoning from drugs, half have been due to barbiturates. Other significant findings are reported.

CANN, H. M. Control of Accidental Poisoning—A Progress Report. J.A.M.A. 168, 6:717 (Oct. 11), 1958.

About Health Surveying—In the 1930's a great deal of thought and energy were given to a variety of health surveys. Then interest seemed to slacken; we were preoccupied with more insistent problems, it would seem. Now we are embarking on new ventures—broad surveys designed to tell us how we really are. So this essay on the assessment of health status, as a part of broader human relationships, is both timely and suggestive.

FELDMAN, J. J. Barriers to the Use of Health Survey Data in Demographic Analysis. Milbank Mem. Fund Quart. 36, 3:203 (July), 1958.

Harmful Noises—If you add the word "public" before the word "health" in the question raised by the title (below) the answer will still be yes in those situations other than the noises that merely annoy and do not necessarily hurt one's health. Before a noise can be adjudged a health hazard, (1) the over-all pressure level of the noise, (2) the way the energy is distributed, (3) the daily exposure, and (4) the years of anticipated exposure must be known.

GLORIG, A., JR., AND SUMMERFIELD, A. Noise—Is It a Health Problem? J.A.M.A. 168, 4: 370 (Sept. 21), 1958.

M.O.H. Speaks His Mind—Only from England could this challenge be expected: the sooner the Society of Medical Officers insists upon using the term "Community Medicine" and drops the word "health," the earlier will it command the attention it deserves in the nation's counsels. This diatribe against "woolly-headed definitions of 'positive health'" is highly entertaining, but it is also sharply pointed. Some of its sharper points may pierce some of our problems of status and place on this side of the Atlantic. Urgently recommended reading for all.

GORDON, I. That Damned Word Health. Lancet 7047:638 (Sept. 20), 1958.

We Just Don't Know—In 1955 the male lung cancer death rate of England was twice as high as that of American men, and the same rate was one and a half times as high for women. Available data do not support the assumption that the difference is attributable to differences in the extent of cigarette smoking. It is possible that some of the difference may be the result of more Britishers living in smoking cities. Maybe most can be charged to better diagnosis.

HAMMOND, E. C. Lung Cancer Death Rates in England and Wales Compared with Those in the U.S.A. Brit. M. J. 5097:649 (Sept. 13), 1958.

To Save Crucial Hours—The London County Council employs 26 mental welfare officers who (on a 24-hour basis) take necessary initial action for the care and treatment of referred cases of alleged mental illness. Who refers the cases and what happens to the patients is the burden of a paper which should prove of interest to those of us hereabouts who, with perhaps less specific legal authorizations, do the best they can with similar sufferers. A following paper discusses some of a local health authority's difficulties in the after-care of discharged mental hospital patients.

HERD, J. A., AND SHADDICK, C. W. Mental Illness (and) LOWRY, D. M. O. Community Care of the Mentally Ill, Present and Future. M. Officer 100, 15:233 (Oct. 10), 1958.

Social Medicine vs. Public Health—"Some (Br.) schools teach one thing, some another, and of course there are those schools in London that have abandoned the teaching of public health altogether." This quotation is a part of a warm discussion on the future of British public health practice and the training of future practitioners. The discussion cannot help but be of interest to all in our ranks who are concerned with the course and future of public health administration in our United States.

JERVIS, J. J. The Teaching of Social Medicine and Public Health. Pub. Health 73, 1:29 (Oct.), 1958.

Long-Duration Services—If it is true that, more and more, we are to be involved in the care of chronic illness and an ever smaller part of our energies are to go to control of infectious diseases then this symposium on neurologic diseases will be required reading for a lot of us. Some of the seven papers may prove pretty discouraging reading to those who have learned to anticipate quick cures and short-term jobs in these days of "miracle" drugs.

MERRITT, H. H. Introduction to a Symposium on Neurologic Diseases. J. Chronic Dis. 8, 4:377 (Oct.), 1958.

It Still Happens Here—Campers from 15 states descended upon a camp-meeting ground, drank water from a well that they promptly polluted with their own sewage, and thereby engendered the widest-spread outbreak of typhoid fever of recent years. Two concurrent diarrheal epidemics also made the meeting notable in the annals of sanitary lapses. The moral of this story should be clear.

NEILL, W. A., et al. A Widespread Epidemic of Typhoid Fever Traced to a Common Exposure. New England J. Med. 259, 14:667 (Oct. 2), 1958.

Straw in Wind—This timely discussion, in nontechnical language, of latest developments in desalting saline water should interest more than just the engineers in these days of ever-shortening water supplies. One California town has erected an electric membrane desalting plant—the first such installation to serve an incorporated municipality, though pilot plants are under field test in other municipalities.

POWELL, S. T. Conversion of Saline Water into Fresh Water. Water Works Eng. 111, 10:933 (Oct.), 1958.

Raised Eyebrow Department—"This is one reason why no eyebrows are raised in Saskatchewan at mention that the budget of the Department of Public Health is $27,671,060 for this fiscal year, constituting 29 per cent of the operating expenses of the government." Well, there would be plenty of raised eyebrows—this side of the border—if any community health service ever received 29 per cent of the municipal budget for any purpose. The reason for the level eyebrows will become known only to those who take the trouble to look up the stimulating paper from which the quotation above was lifted.

SMITH, C. The Role of the Voluntary Health Agency. Canad. J. Pub. Health 49, 9:387 (Sept.), 1958.

Well Told Tale—This story about opening the doors of a Canadian mental hospital, though not entirely new, is so simply and engagingly told that it cannot be passed by. So anyone with a story of his work to tell, is hereby encouraged to take a big leaf from this author's modest little book.

SNOW, H. B. The Open Door Hospital. Canad. J. Pub. Health 49, 9:363 (Sept.), 1958.

If additional information is desired regarding the articles listed in this bibliography, please communicate directly with the publications in which they appeared; the addresses are furnished for your convenience.

Am. J. Nursing (American Journal of Nursing), 2 Park Ave., New York 16, N. Y.
Brit. M. J. (British Medical Journal), British Medical Association House, 19 Tavistock Sq., London, W.C.1, England.
Canad. J. Pub. Health (Canadian Journal of Public Health), 150 College St., Toronto 5, Canada.
J.A.M.A. (Journal of the American Medical Association), 535 N. Dearborn St., Chicago, Ill.
J. Chronic Dis. (Journal of Chronic Diseases), C. V. Mosby, 3207 Washington Blvd., St. Louis, Mo.
Lancet, 7 Adam St., Adelphi, London, W.C.2, England.
M. Officer (Medical Officer), Chronical House, 72–78 Fleet St., London, E.C.4, England.
Milbank Mem. Fund Quart. (Milbank Memorial Fund Quarterly), 40 Wall St., New York, N. Y.
Modern San. (Modern Sanitation), Power Magazines, Inc., 855 Avenue of the Americas, New York 1, N. Y.
New England J. Med. (New England Journal of Medicine), Massachusetts Medical Society, 8 The Fenway, Boston 15, Mass.
Pub. Health (Public Health), Society of Medical Officers of Health, Tavistock House, Tavistock Sq., London, W.C.1, England.
Roy. Soc. Health J. (Royal Society for the Promotion of Health Journal), 90 Buckingham Palace Road, London, S.W.1, England.
Statist. Bull. Metrop. Life Insur. Co. (Statistical Bulletin Metropolitan Life Insurance Company), One Madison Avenue, New York 10, N. Y.
Water Works Eng. (Water Works Engineering), Reuben H. Donnelley Corp., 305 East 45th Street, New York 17, N. Y.

NEWS FROM THE FIELD

WHO News

Changes in the Western Pacific

Many of the health services in the countries of the Western Pacific are being modernized and decentralized with more attention to rural areas and the integration of specialized campaigns into comprehensive public health programs. Another significant change in the area, as reported by Dr. I. C. Fang, director of WHO's Regional office in Manila, is the development of mental health programs. A great increase in public interest in mental health was noted. In this connection WHO will shortly sponsor an Asian seminar on Family Life and Mental Health.

Among other items reported by Dr. Fang at the regional committee's ninth meeting in late September is the attention paid to evaluation by the Regional Office. Such evaluation has shown that many projects have reached the stage where it will soon be possible to withdraw WHO technical services in behalf of complete local operation.

This session was held in the new Regional Office building which will house also offices of the United Nations and the specialized agencies. Filipino president, Carlos P. Garcia, formally opened the new building. Representatives of nine Western Pacific countries and of countries responsible for territories in the region attended the sessions.

Pan American Sanitary Conference

The recent 15th Pan American Sanitary Conference voted to change the name of the "world's oldest health organization" from "Pan American Sanitary Organization" to "Pan American Health Organization." This reflects the belief that the word "health" more accurately describes the character and functions of the organization in the broad field of public health.

At the conference also, a budget of $3,600,000 was adopted for 1959 health operations. In addition, about $7,000,000 will be available from such other sources as regional allocation of funds by WHO from its regular budget and UN Technical Assistance funds and special funds from grants and donations, especially the Bureau's Special Malaria Eradication Fund. Thus, with more than $10,000,000 of funds available PASB will render assistance to some 215 health programs during the coming year.

Among the reports presented at the conference was one on the work of the Institute of Nutrition of Central America and Panama by its director and the Bureau's nutrition chief, Dr. Nevin S. Scrimshaw. He reported that more than 1,000 fellows from 19 of the 21 American Republics and from 25 countries outside the Americas, have participated in courses or studies in which INCAP has cooperated. On the basis of his report, the conference recommended that the hemisphere governments intensify surveys on nutritional conditions, enrichment of foods, and exchange of basic food products in order to help overcome their respective chief nutritional deficiencies. Particularly emphasized was the importance of nutrition in the curricula of graduate schools and postgraduate courses.

President of the conference was Dr. Guillermo Arbona, health secretary of Puerto Rico. Representatives of Brazil, Honduras, and the United States were elected to membership on the organization's seven-member executive committee for a period of three years, replacing the representatives of Bolivia, Cuba, and Nicaragua, whose terms of office expired. The four members remaining on the committee are Guatemala, Mexico, Peru, and Venezuela. The opening session was addressed by Dr. Leroy E.

Burney, Surgeon General of the U. S. Public Health Service, and Dr. Fred L. Soper, retiring PASB director.

Four Years' Health in the Americas

At the 15th Pan American Sanitary Conference in Puerto Rico in October, the quadrennial report of WHO's Regional Office was presented. Here also the "Summary of Four Year Reports on Health Conditions in the Americas" first appeared. This country by country report on health conditions was prepared for the representatives of the 21 American republics, France, Netherlands, and the United Kingdom, who attended the conference.

The conclusion of the report is that in spite of recent successes, health problems facing the Americas are still enormous and preclude any victory celebrations. Communicable diseases are reported to be the main cause of death, especially in childhood. Malnutrition is also a major factor in early childhood mortality. Because the percentage of populations with water supply systems varies from 13 to 75 per cent among the countries, a concerted program was recommended to provide water supplies to all urban communities in the hemisphere. Almost everywhere there is acute need for more trained medical and nursing personnel.

Aid to American Zoonoses Center

The Rockefeller Foundation has made a grant of $10,000 to the Pan American Sanitary Bureau to aid the activities of a technical advisory group on zoonoses problems in the Americas. Upon the recommendations of this group will be based future cooperative control programs to be carried out by health and agricultural authorities of the 21 American republics. The coordination of this program is in the hands of the Pan American Zoonoses Center, reportedly the only institution of its kind in the world. As an indication of the importance of the zoonoses a recent meeting of a WHO expert committee, meeting recently in Stockholm, listed more than 100 such diseases.

Conference on Recruitment

A conference on recruitment for personnel in the health field, requested by a number of national professional organizations, was held in New York City October 2–3. Sponsored by the Commission on Health Careers of the National Health Council, its purpose was to "give the professional associations in the health field an opportunity to share experience about recruitment programs, including methods and materials." Among recommendations made by the group were:

1. A repetition of the conference whereby the individuals of various national organizations responsible for recruitment and vocational counseling might learn about each others programs and activities and have an opportunity to become acquainted with their counterparts.
2. Preparation of a list of persons responsible for vocational counseling, recruitment, and employment services in the health agencies.
3. Development of a clearing house of experience and ideas, logically to be conducted by the National Health Council.
4. Stress on the need for research in recruitment methods, materials, and results.
5. Preparation of a common exhibit outlining the health field that might be adapted to the particular interests of any one of the national organizations involved.

Muriel C. Henry, director, Information Service, National League for Nursing, chaired the meeting. Among the speakers was the commission chairman, Leonard A. Scheele, M.D., who outlined the commission's program and objectives. Francis B. Elder, engineering associate, represented the American Public Health Association.

Industrial Health Training

Graduate training in industrial health is being offered respectively for engineers and physicians. The three-year fellowships for physicians, which leads to the degree of doctor of science in industrial medicine, is available for graduates of approved medical schools who have completed at least one year of internship. During the three-year course two years are devoted to academic and clinical study in industrial medicine, the third year in residency in an industrial medical department or comparable organization. The course leading to the degree of doctor of science in industrial medicine satisfies the requirements for certification in occupational medicine by the American Board of Preventive Medicine. A one-year course is also offered for candidates for a master of science degree.

Stipends for the first two years range from $3,000 to $4,000, depending on marital status. In the final year compensation is by the organization in which the fellow is training.

The training in environmental hygiene for engineers and scientists is also a three-year course leading to the doctor of science degree in industrial health. Two years are devoted to academic study and a third to preparation of a thesis with possible additional practical work. Here, again, a one-year course leads to the master of science degree. Annual stipends are $3,000 for unmarried students; $3,600 for married.

In each case, additional information from: Secretary, Institute of Industrial Health, Eden and Bethesda Avenues, Cincinnati 19, Ohio.

Consolidation in Washington

Both city and county officials of Everett and Snohomish County in Washington have approved the merger of their respective health departments to create a single city-county department serving the approximately 120,000 inhabitants of the area. Under the merger plan county officials will create a county health district which Everett will petition to join. A 1959 budget of $230,000 is to be shared by county, city, state, and school districts. The county health officer, Roger Knipe, M.D., D.P.H., will continue to serve and will be assisted by the present city health officer, William Ebert, M.D. The new department is expected to begin operation January 1, 1959.

NAS Conference in 22nd Session

Rapid population growth and technological changes are placing on the public health sanitarians of the nation, increasing demands for effective sanitation control, Mark Hollis, Assistant Surgeon General of the Public Health Service, told members of the National Association of Sanitarians recently. At the banquet session of its 22nd annual Educational Conference in New York, July 28–August 1, he said the sanitarians have a major job to maintain the progress that has been made and to meet future challenges. He urged close cooperation among the various professional groups of sanitarians as a means of better fitting them to meet the challenge.

For his outstanding contribution to the profession, Harlan W. Kingsbury of the Newton (Mass.) Health Department received the Association's 1958 Walter S. Mangold plaque, which was presented at the banquet session by Professor Mangold of the School of Public Health, University of California.

The program for the conference, prepared by a committee under the chairmanship of Jerome Trichter, New York City assistant commissioner of health, covered a wide range of topics. Among these were "Biological and Chemical Additives in Foods," "Acute Respiratory Diseases and the Sanitarian," "Air Pollution Problems in Large Cities," "Sani-

tation Aspects of Drinking Fountains," "Man's New Chemical Environment," and "Vending Machines."

A special feature of the program was a demonstration of the "brainstorming" technic "which enables a group to pool their creative thinking abilities in attacking a problem." This was presented by Catherine R. Ready, assistant director, Educational Service Department, Bristol-Myers Company.

The following officers were elected at the meeting:

President—Franklin Fiske, M.S.P.H., Denver City-County Health Department.
President-Elect—Walter W. Kimsey, Burbank (Calif.) Health Department
Vice-Presidents—R. D. Kalling, administrative officer, Fond du Lac Health District, Wisconsin Health Department.
Major V. Harry Adrounie, Office of the Air Force Surgeon General, Washington, D. C.
Treasurer—Melvin Wilkey, Denver City-County Health Department.

1959 Crumbine Award Competition

The Public Health Committee of the Paper Cup and Container Institute has announced the 1959 competition for the annual Crumbine Awards. There are two types of awards: one for "outstanding achievement in the development of a program of eating and drinking sanitation"; a second for "outstanding achievement in the development of a comprehensive program of environmental sanitation."

Entries for the 1959 awards must be completed by March 1, 1959. Entry blanks may be obtained from Crumbine Awards Jury, Room 1020, 250 Park Avenue, New York 17, N. Y.

The 1958 awards, both to West Coast health departments, were presented at the annual meeting of the Western Branch, American Public Health Association in Vancouver, B. C., in May. The Spokane Health Department received top honors for developing a program of eating and drinking sanitation. In making the award particular attention was paid to the department's emphasis on voluntary rather than compulsory methods of bringing eating establishments up to the highest standards. The health officer and chief general sanitarian, Hampton H. Traynor, M.D., and Charles K. Reagan, respectively, received personal medallions and a plaque for their department.

The award for development of a comprehensive program of environmental sanitation was won by the Los Angeles Health Department, which was cited for an unusually well diversified and pioneering program over a wide territory covering nearly two and one-half million people. George M. Uhl, M.D., the city health officer, and Charles L. Senn, director of its sanitation services, accepted the plaque in behalf of the department and were given personal medallions.

Pilot Diabetic Case-Finding Study

Following a seven-county pilot study the Bureau of Special Health Services of the Florida State Health Department, now reportedly is locating diabetics and making them aware of their condition more readily and at less expense than earlier. The new procedure involves offering a test for abnormal sugar content to the blood relatives of known diabetics receiving free insulin from health or county welfare agencies. In the seven counties studied the public health team found from three to four times as many diabetics among relatives of diabetics as in the general population. Of 490 tests given to blood relatives 6 per cent had a positive reaction as compared to fewer than 2 per cent in the general population.

One Copy Free

The Foundation on Employee Health, Medical Care, and Welfare (477 Madison

Avenue, New York 22, N. Y.) reports that one complimentary copy of the two-volume "Problems and Solutions of Health and Welfare Programs" is available free on request. Prices quoted earlier (A.J.P.H. 48:1434 (Oct.), 1958) are for additional copies. The mailing list built up from requests will be used to distribute one complimentary copy of future reports of studies. The Board of Directors desires "to disseminate information regarding the wisest and most efficient use of collectively-bargained health and welfare benefits to the widest audience possible."

Registration of Physical Therapists

A 1958 act of the Massachusetts Legislature makes mandatory the registration of physical therapists practicing in the state. The law becomes effective on January 1, 1959. Commenting on the act, Janice Rafuse, M.D., director of the Crippled Children's Services of the State Department of Health, said, "For the first time in the history of the Commonwealth, protection is now assured to the public against persons posing as physical therapists and giving treatment without medical or surgical supervision." Under the law anyone who has practiced in the state for one of the three years preceding the effective date of the act may be registered without examination.

Fluoridation for Sweden

The Swedish Royal Medical Board, after a study by a group of experts on the three principal methods for prophylactic application of fluoride, has concluded that "at present neither topical application of fluoride nor administration by other alternative vehicles can replace water fluoridation." As a part of its recommendation it says that, "The incidence of dental caries in Sweden has reached such proportions that all available means for its combat have to be utilized. Fluoridation of drinking water is one of the methods that should be employed." Further, the "first condition for fluoridation is that it should be carried out under strict control. This includes, for one thing, supervision to assure that the population in a place for which fluoridation has been planned, is not exposed in any higher degree to the effect of fluorides from other sources, for instance food-stuffs or industrial gases. The apparatus for adding fluoride should also be technically fully satisfactory, and the fluoride content of the water should be checked regularly and with reliable methods. In accordance with the advisory committee the Board finds that continuous odontological and medical control of children and young persons is essential in places where a fluoridation scheme is started, and that the collected material from these places should be studied scientifically."

Postgraduate Cerebral Palsy Course

A course designed to provide basic knowledge about cerebral palsy, to review the present status of therapy, and to point out the controversial features of present understanding is being given by the College of Physicians and Surgeons, Columbia University. Sponsorship is by the United Cerebral Palsy Associations.

Designed for potential leaders in this field the nine-week course is divided into two parts. Physicians attend only the first three weeks; nurses and therapists have an additional six weeks. During the three weeks the course includes lectures and demonstrations plus five days in cerebral palsy facilities. The last six weeks for nurses and therapists include 22 days in clinical experience in all types of facilities in the New York area—diagnostic, inpatient, outpatient, rehabilitation, recreation, school, and custodial. This course carries eight points of academic credit.

Dates are March 2–May 1, 1959, with the physicians' course ending on March 20. Fee for the physicians course is $100; for the nine week course, $210. Some scholarships are available.

A list of scholarship sources and an inquiry blank are available from Postgraduate Course in Cerebral Palsy, College of Physicians and Surgeons, 630 West 168th St., New York 32, N. Y.

Reviewing AEC's Cancer Program

The cancer program of the Atomic Energy Commission is under review by a five-man committee of the American Institute of Biological Sciences. It is studying existing programs and advising AEC regarding future use of radioactive materials in the fight against cancer. It will also evaluate cancer programs in AEC laboratories and in university research centers. Chairman of the committee is Howard B. Latourette, M.D., Cancer Research Institute, and associate professor of radiology, University of Michigan, Ann Arbor.

PERSONALS

LELAND E. AASE, M.P.H., former director of public health statistics, South Dakota State Health Department, is now statistician, Bureau of Public Health Statistics, Wisconsin State Health Department.

ROBERT BARNES, M.D. has been assigned to the Washington State Health Department by the Public Health Service to work with the department's chronic disease program.

WILLIAM BECQUE,† former director of public services, has been appointed executive director, District of Columbia Tuberculosis Association, succeeding the late EDWARD K. FUNKHOUSER.

JOHN H. BROWN, V.M.D.† has succeeded B. SCOTT FRITZ, V.M.D.,* as managing director, Wyeth Biological Laboratories, Marietta, Pa. The latter continues as resident officer but is relieved of management burdens through consideration of his health.

JAMES B. COREY, former Northeastern regional director, National Multiple Sclerosis Society, is now director of water works advancement, American Water Works Association.

DAVID R. L. DUNCAN, M.D., formerly loaned to the Montana State Health Department by the Public Health Service as medical officer, Flathead Indian reservation, and medical director, Montana's Health District II, is now chief, Maternal and Child Health Section, Alaska Department of Health.

DONALD W. DUNN, former administrator, Henry County Memorial Hospital, Mt. Pleasant, Iowa, is now hospital consultant, Division of Hospital Services, Minnesota State Department of Health.

ROBERT N. GILLILAND, M.D., who recently completed his interneship at Charity Hospital, New Orleans, La., has been appointed director, Attala-Leake Counties Health District, Miss.

O. R. GREGG, M.D.,† director, Cleveland, McClain, and Garvin Counties Health Departments, has retired after 17 years of service as a county health officer in Oklahoma.

NORMAN H. C. GRIFFITHS, D.D.S.,* associate professor, prosthetic dentistry, Howard University, is on leave for a 10-month period under a Smith-Mundt grant by the Department of State to serve as visiting professor of prosthetic dentistry, University of Ceylon, Colombo.

NAOMI KENNEDY, R.N., former supervisor, public health nursing, northeast district of six counties, is now public health nursing consultant in the Mental Health Division, Central Office, Colorado State Health Department.

VERA E. KERSTELL,† former nutritionist, North Carolina Board of Health, is now nutritionist, Bureau of Maternal and Child Health, Wisconsin State Health Department.

ROBERT C. KIMBALL, former assistant director of hospital facilities, Idaho Department of Health, is now assistant chief, Hospital Services, Colorado Department of Public Health.

ANNE LEE, R.N., has been appointed consultant public health nurse, Bureau of Maternal and Child Health, New York State Health Department.

JOHN A. LICHTY, M.D.,* formerly serving as pediatric consultant while assistant associate professor of pediatrics, University of Colorado Medical School, is now full-time pediatric consultant, Colorado State Department of Public Health.

ELI LILLY, chairman, Board of Directors, Eli Lilly and Company, has been named 1958

* Fellow.
† Member.

recipient of the Remington Honor Medal, American Pharmaceutical Association.

JAMES T. MADDUX, M.D., who recently completed his interneship at Charity Hospital, New Orleans, La., has succeeded C. M. Shipp, M.D., retired, as health officer of Hancock and Pearl River Counties, Miss.

JOHN D. MCGANN, former teacher, Perkins School for the Blind, Watertown, Mass., is now coordinator and educational director, Center for Cerebral Palsy and Handicapped Children, Billings, Mont.

JOSEPH B. MCGRORY, former technical consultant, Division of Radiological Health, Public Health Service, has been assigned to the section of radiation and occupational health, Minnesota State Department of Health.

CHARLES H. MILLER, JR., M.D., director, Comanche, Jackson, and Tillman (Okla.) Counties Health Departments, has resigned to become health director, Wichita County, Wichita Falls, Tex.

ROBERT F. MINES, former chief psychologist and director of rehabilitation, North Carolina State Hospital, Raleigh, is now clinical psychologist, Alaska Department of Health.

STEVEN L. MOORE, M.D., who completed his interneship in Arkansas Baptist Hospital in June is now health officer, Southeastern Health District of three counties in Mississippi with headquarters in Lucedale.

MARION NEILSEN, R.N., former public health nursing consultant, District II Office at Mankato is now supervisor of district health nursing activities, Division of Local Health Administration, Minnesota Department of Health.

Z. E. OSWALT, former field representative, has been named deputy state registrar of vital statistics and assistant director, Division of Public Health Statistics, Mississippi State Board of Health.

LUCILLE PAZANDAK, formerly in casework in Minneapolis, is now medical social consultant, Alaska Department of Health, assigned to the Southcentral Regional Office at Anchorage.

JOHN A. PERKINS, Ph.D., president, University of Delaware, has been appointed chairman, Commission on the Survey of Dentistry in the United States, by the American Council on Education.

MARGARET E. RICE, M.Sc.,* former supervisor of statistical service, has been named director of the newly created Division of Public Health Statistics, which combines the Vital Statistics Division and Statistical Service, Mississippi State Health Department.

PATRICIA SCHLOESSER, M.D.,† former acting director, has been appointed director, Division of Maternal and Child Health, Kansas State Board of Health.

BOYCE M. SKINNER, M.D., M.P.H., former medical officer-in-charge, P & C Regional Center in Greenwood, is now Leflore County (Miss.) health officer.

GEORGE V. SMITH, M.D., who recently completed his interneship at Charity Hospital, New Orleans, is Jackson County (Miss.) health officer.

JACK I. SMITH, M.D.,† health officer, Clallam and Jefferson Counties District, Washington State Health Department, has resigned in order to continue graduate studies at Tulane University.

WILLIAM F. STEWART has succeeded Norma Loeffler as statistician, Bureau of Public Health Statistics, Wisconsin State Health Department.

EVAN W. THOMAS, M.D.,† associate physician, Public Health and Venereal Disease Division, New York State Department of Health, has retired and is living in Weston, Vt.

MARVIN D. TYSON, former field representative, State Department of Public Welfare, is now coordinator, Department of Civil Defense's health, medical, and special weapons defense service, Division of Local Health Administration, Minnesota Department of Health.

DANIEL WEINER, D.V.M., has been loaned by the Public Health Service to the Washington State Health Department, to work with the epidemiology staff in prevention and control of diseases of animals transmissible to man.

ROBERT M. WHITE, Ph.D., former instructor and counselor, University of Minnesota College of Education, is now director of research, Division of Hospital Services demonstration study project, Minnesota State Department of Health.

JOHAN WINSSER, M.D., D.V.M., senior medical bacteriologist, Division of Laboratories and Research, New York State Health Department, has accepted the position of assistant director, Division of Laboratories, Nassau County Health Department.

JAMES WREN-JARVIS, M.P.H., former consulting engineer, is now district sanitary engineer, District 7, Wisconsin State Health Department, at Chippewa Falls.

DEATHS

JOHN F. ANDERSON, M.D.,* past president of the American Association of Pathologists and Bacteriologists and the American Public

* Fellow.
† Member.

Health Association, on September 30 at the age of 87 (Laboratory Section).

GUY L. ELLIOTT, M.S.,† with the Statistical Research Unit, American Cancer Society, New York, N. Y. (Public Health Education Section).

JOHN L. HYDRICK, M.D.,† acting health officer of Phoenix—Maricopa County, Ariz., and formerly on the staff of the Rockefeller Foundation with service in Indonesia and Peru, on August 29 at the age of 70 (Public Health Education Section).

J. HAROLD SHAW, M.D., D.P.H.,† director, Division of Laboratories, Department of Health and Welfare, Charlottetown, P.E.I., Canada (Laboratory Section).

ORVILLE C. MCCANDLESS, M.D.,† of Cheyenne City-Laramie County Health Department, Cheyenne, Wyo., on September 12 (Health Officers Section).

J. M. Wisan, D.D.S., M.S.P.H.,* director of dental health, Philadelphia (Pa.) Department of Health on October 5 (Dental Health Section).

CONFERENCES AND DATES

State and Regional Public Health Meetings—December, 1958, and January and February, 1959:

California, Southern, Public Health Association. Huntington-Sheraton Hotel, Pasadena, December 5.

Massachusetts Public Health Association. Massachusetts Institute of Technology, Boston. January 29.

Mississippi Public Health Association. Robert E. Lee Hotel, Jackson. December 3–5.

Texas Public Health Association. Hotel Gunter, San Antonio. December 23–25.

Meetings of Other Organizations:

American Academy of Occupational Medicine. Sheraton Plaza Hotel, Boston, Mass. February 11–13.

National Social Welfare Assembly. New York, N. Y. December 9–11.

National Society for the Prevention of Blindness. New York, N. Y. February 25–27.

Northeastern Weed Control Conference. Hotel New Yorker, New York, N. Y. January 7–9.

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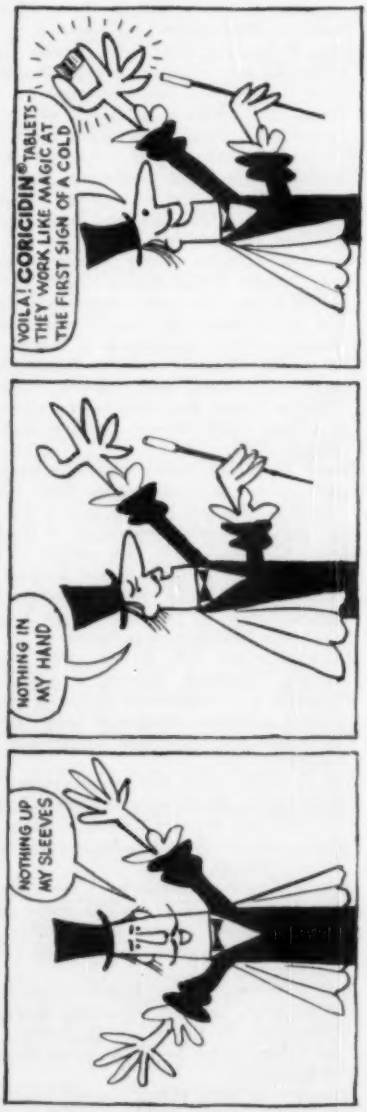
* Fellow.
† Member.



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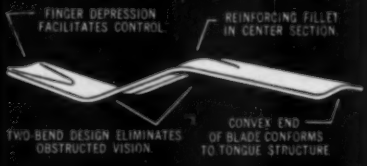
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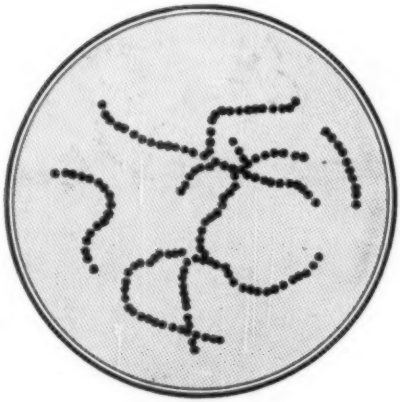

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